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HEREDITARY TRANSMISSIONS.

BY T. B. GOODALL, M.R.C.V.S., CHRISTCHURCH.

TAKING a retrospective survey of the history of the veterinary profession for the last few years, we may, I think, adduce as one reason for its rise in the estimation of, and the increasing recognition of its usefulness by, the educated public, to its having struck boldly at the *cause* rather than treating the *effects* of disease in each crisis in which it has been called upon to advise and act.

To what extent the profession has been responsible for the mitigation of the many diseases of the eyes, air passages, and other organs, by the advice it has given regarding the construction, light, ventilation, and drainage of stables, etc., can never be fully demonstrated.

So with the whole category of the contagious diseases of our domestic animals, and the part the veterinary profession has taken in aiding to frame the laws for their eradication.

Our advice and guidance is now sought by the public on a point of as great importance to the community as any one of those that have engrossed the attention of the profession in the past. We are asked to define what shall constitute hereditary unsoundness in horses.

We ought, I imagine, to feel regret that our Council were so hasty in framing their reply. To an outsider, it would appear as though they were alarmed by an imaginary sphinx, but really it was not a question of urgency involving the life of those to whom it was addressed.

However that may be, the fact now stands that after deliberation and consultation with the whole of the profession, our Council have submitted to the Societies by whom they were solicited a list of ailments that they considered likely to be transmitted from parent to offspring. Each item of this list, if accepted, would for the future compel the veterinary advisers in show-yards to point

out such to the stewards and judges as a legitimate cause for disqualification.

I most respectfully submit that it is impossible for any man, or for any number of men, to make a list of diseases and abnormalities, and insist that these must, under all circumstances, be transmitted from sire or dam to their progeny; and yet this is what we, as a profession, are committing ourselves to do, and when we pronounce and seriously advise these Societies to look upon every individual Side-bone, Ring-bone, Wind-gall, Curb, Spavin, Thoroughpin, etc., etc., etc., as a disqualification for stud purposes, are we not in danger of overstepping the bounds of sound practical common sense, and tending to bring the profession into disrepute? Shall we not be inflicting an injustice on a class of men who are doing good service to the community, and shall we not be hindering, rather than furthering, the objects of those who are striving so hard to see our old England ever foremost in her breeds of horses?

The Council is reported to have ruled that these resolutions are not intended to direct veterinary surgeons in practice, *i.e.*, to advise a client that he may breed from a certain animal is permissible; but if the adviser is officially connected with the show, he must reject the same animal, which is absurd.

In dealing with the question at issue, are we keeping up the traditions of the profession? Are we not rather striking more at the *effects* than the *cause* of a system?

The point which has been apparently overlooked in the deliberations of the various bodies of the profession is, that the primary cause of any one of the list of ailments (certainly all the diseases of bone enumerated by our Council as legitimate reasons for disqualification) may have been induced by the unnatural and irrational system of breeding from immature parents.

I have carefully perused the papers that have been read, and the discussions on those papers, before Veterinary Medical Associations, and I have noticed but one allusion to this subject, and that in a casual way, by Mr. Rutherford, when he spoke of having traced the cause of the appearance of certain diseases of the bones and joints of horses in Australia to their having been bred from immature parents.

Is it not customary in this country to breed from horses at three, aye, at two years old even? and do not we, who are conversant with a few of the mysteries and marvels of the development of the organisms of our domestic animals, know that at these ages the horse is quite immature? As I write this, I have before me the heads and other bones of two and three-year-old horses, and I notice them soft, spongy, friable, *immature*, showing in every part a lack of development as compared with the bones of older horses,

and I ask myself, is it reasonable to expect *equally mature* hard stock from the parents from whose bodies the imperfectly developed bones were taken, as from thoroughly matured parents?

I carry my reasoning further, and argue that if animals with their bones (and therefore other tissues of the body also) but imperfectly developed, are allowed, in man's wisdom of artificial selection, to become the progenitors of their kind, should we not expect the stock so begotten to be prone to diseases of tissues induced by bringing those tissues into exertion, or exposing them to concussion? More especially should we expect a disposition to diseases of the bones and joints of the limbs of the horse from such a cause, since he is essentially a beast of burden or draught.

Let me give a possible illustration of the deleteriousness of this system in inducing disease or unsoundness in our horses. We know that it has happened that a horse begotten by a two-year-old sire has developed into a "champion" at shows. I do not consider this weakens my argument, because though such an animal may be good-looking enough to satisfy the most fastidious, his tissues may still lack tonicity, *and he, being bred, fed, and kept for show only*, may never have had the test of work. As a prize-winner, he is used extensively for breeding purposes, and his stock, when worked, develop various unsoundnesses. Could not the reason be traced, in such instances, to their immature grand-sire?

Mr. Hunting, in the opening remarks of his most excellent paper, reminds us that every organism, even the most complex, originates in a cell; that the *life*, the mysterious *force* that rules and governs the whole future of that organism, is implanted into it at the moment of its inception, and this *life* has all the peculiarities and eccentricities of the parents. That it must be received at this moment is patent from the fact that in the case of horses the offspring rarely sees its sire, and rarely do the sire and dam meet again. And yet the offspring has certain peculiarities from each!

This, then, seems a reason why sire and dam should themselves be mature (and this necessity is recognised in our own case by the marriage laws of the realm), or the life-organism they originate must suffer from its very beginning from the drawbacks of their immaturity, *i.e.*, if the embryonic germ of the future horse is not, at its inception, endowed with all the elements of perfect maturity, because its parents were not endued with the power of transmitting those elements, therefore every tissue of which that cell is the founder and builder must always lack those elements.

If we gain certain advantages by violating nature's laws in our system of artificial selection, we can only expect equivalent drawbacks, for "Nature will always avenge herself."

After all, our boasted wisdom is but a fraction of the great mystery around, and when we open our eyes to notice its fearful majesty, how beautifully and rhythmically it works, what care there is taken that only the matured and the tried shall propagate their kind; is it not here, from the book of Nature, we should look for our lesson and guidance?

Watch a grand old stag, or a wild stallion, how he beats oft all young intruders from the sanctity of his harem, and how jealously he vindicates the least approach to familiarity! During the breeding seasons there are terrific battles between the stags or horses, as the case may be, but the mature ones always succeed in driving off the young or feeble ones. May we not deduce the lesson of the "survival of the fittest"?

If we, as a profession, would be true to the traditions of the past, and if it be our desire to discover the primal cause of many unsoundnesses, let us first satisfy ourselves whether this unripe fertilisation is not the initial evil which predisposes the embryo to any of the others. If it be so (and there is fair reason for such an assumption), then I take it, if we advised strongly at all times against such practice, we should be grappling with the *cause* rather than dallying with *effects*.

Now let us glance at the list of what we may be called upon in the future to designate "transmissible unsoundnesses." Independently of my argument as to the age of the parents, I most respectfully submit that any one of them may, under certain circumstances, be accidental, and therefore not transmissible; and as this is the delicate point to decide, the veterinary adviser at a show should not only be a thoroughly competent veterinary surgeon, but also a thorough horseman.

It would take too long to enumerate each of the diseases *seriatim;* but taking one case for illustration, we will suppose that the veterinary surgeon is asked to decide as to the merits for stud purposes between two mares, one a really good-shaped animal, and well proved as to capabilities in the hunting-field, but with a curb, in such a case probably the result of an accident; while the other is, technically speaking, perfectly sound, for never having been put to the test of work, her legs and joints may be quite free from blemish, yet this animal may not be nearly so well-shaped as the former one. Would any practical horseman hesitate for a moment as to which he would prefer for the stud? And yet *at a show* the veterinary surgeon, under the new regulations, must step in and condemn the good and tried animal, and pass the medium one!

Let us remember that we shall not be asked to adjudicate as to whether the animal before us is sound or unsound; but is it

affected with any ailment that it will transmit to its progeny? In such a case it is only the combined testimony of the veterinary surgeon and horseman which can be satisfactory.

In the exhibition of horses, even in such a noble sight as that lately seen at the Agricultural Hall, never to be forgotten by those who witnessed it, is there not a danger that the system of showing horses *as a business* tends to their being bred, fed, and fattened for show, and show only; thus exaggerating the importance of certain points, and ignoring the still more important qualities of endurance and stamina, which can be tested only in absolute practice.

Might we not advise the Societies to encourage the showing of animals of proved capabilities and adaptability for the special work for which their stock will be required? such as jumping-prizes for hunters, or even, as in the *old* steeplechases, a prize for endurance, and a prize for staunchness in the collar for some of those beautiful sleek cart-horses?

Might not some such resolution as the following be submitted, viz.:—"With the object of preventing the so frequent recurrence of unsoundness in our best breeds of horses, we advise the Societies interested to encourage the breeding from mature parents, and, when practicable, to give the preference to animals of proved capability for endurance or work over those that have not had this test."

I do not anticipate that these views are likely to be received favourably by the public *at once;* but if this theory is a sound one, and if, in the course of time, it can be shown that its adoption is followed by beneficent results, then the public may be induced to carry it into practice.

My only reason for recording my thoughts in such a long paper is that the profession may be led to consider the subject in the aspect in which I have endeavoured to bring it before them. Whether the ideas here mooted are found practical, or if they are discarded as useless, I shall have the satisfaction of knowing that I have performed a duty that I felt to be incumbent on me.

A STUDY IN CANINE PATHOLOGY.

BY W. S. ADAMS, V.S. (1ST CLASS), A.V.D., REMOUNT DEPOT, OOSSOOR, MADRAS.

THE following is the history of an outbreak of disease amongst my dogs, from which the whole, four in number, died. The dogs were—

(1) "Waler," a well-bred imported Australian Kangaroo dog, five years old.

(2) "Witch," a cross-bred (Polygar and Australian), nine years old.

(3) "Whistle," } young dogs, the offspring of the above.

(4) "Rattle," }

At the end of May, 1888, I went on three months' leave, leaving the dogs in good health. On my return, at the end of August, I found each dog sick and weakly, especially Whistle and Waler. At first I did not think that they were suffering from any disease of a special nature, but thought that the different life they had led during my absence had probably had an injurious effect on their health. This opinion was partially confirmed by the steady improvement in Waler on simple tonic treatment, careful feeding, and exercise.

Witch and Whistle continued to fall away; first Whistle died, and then Witch. Rattle lived for another month, when he died, and a month later Waler died, after a sudden relapse. During the time that Rattle was sick I felt convinced that all my dogs were suffering from the same disease, which was of a special nature.

I determined, as far as was possible at this time, to try and find out the pathology and origin of the disease. I will first give the symptoms, which, generally speaking, were similar in each case.

1. *Loss of flesh* was very gradual at first, but progressive unhealthiness of the coat and dulness were the first symptoms of ill-health. After a time, when the appetite became affected, the wasting became more rapid.

2. *Appetite.*—At first unimpaired, but subsequently it became capricious, though it did not entirely fail till towards the end. This was especially the case with regard to Rattle, who ate his feed till the day before his death.

3. *Bowels.*—The state of the bowels during the illness was the same in each case. At the time of the dog showing the first symptom of ill-health the bowels were constipated, sometimes obstinately so; subsequently they became irregular, Diarrhœa set in, and latterly Dysenteric evacuations were passed, accompanied by severe pain and straining.

4. *Thirst.*—From the first the sick dogs were very thirsty, and towards the end this thirst became intense.

5. *Fever.*—The surface of the skin was very hot and dry, but the internal temperature did not rise till about the time the Diarrhœa set in, when the fever was very high, and the thermometer registered 104° to 105°.

6. *Cough.*—In each case, before death, there was a deep and painful cough.

7. *Vomition.*—With neither Whistle nor Witch was any vomiting, but with Rattle and Waler, especially the latter, it was very distressing.

8. *State of the Skin.*—This was almost the first indication of ill-health. The coat became unhealthy in appearance, and the skin infiltrated. Subsequently, there was a loss of hair, especially about the limbs and feet, which became œdematous and very tender.

Later, sores broke out on various parts of the body, especially about the limbs and head. The skin itself was hot, a large amount of dandruff was formed, and there was a peculiar smell arising from the skin of the sick dog.

Micro-organisms.—I examined, microscopically, the discharge from a sore on the elbow of the dog Rattle, and also the blood taken from a puncture on the inside of the thigh. In both I found innumerable micro-organisms. Whilst Waler was sick I frequently examined the blood, and invariably found micro-organisms present, and after death I found them in the blood taken from each organ, but they were more numerous in blood taken superficially from the integument, and in an atom of blood from a small puncture made behind the elbow I found micro-organisms swarming.

Pathology.—I am of decided opinion that the disease is of a specific nature, and as far as I am aware is one which has hitherto not been described as a disease to which the dog is liable. The micro-organisms I am unable to recognise, but from the facts stated hereafter I consider that they are pathogenic.

Before entering into further details I will note the conditions under which the dogs were prior to the attack.

Feed.—The dogs were regularly fed, the feed consisting chiefly of boiled rice and scraps of mutton boiled to shreds. They were housed at night, and were provided with cots to lie on, and were regularly groomed.

Exercise.—Whilst I was at home, although the dogs did not get regular work, they were only tied up at night and were given an occasional run.

Cause.—From the above I do not think we can look for the cause of the disease either to want of sanitation or injudicious feeding. Although doubtless want of exercise and unaccustomed confinement would affect their general health and render them predisposed to disease, this could not alone produce the special disease from which my dogs died. I am, therefore, led to inquire into the probable source of infection, and I think this is not far to seek. When I left, a dog was brought on to the premises, which was sick, and I can now see he appeared to be in the last stage of a disease similar in character to that from which my dogs died. This dog died in a very short time. He was very emaciated, his skin was in the same state which I have described above, and before death he had Diarrhœa and Dysenteric symptoms. Another dog was also sick, and very emaciated and almost hairless; this dog did well and partially recovered, but subsequently he had a relapse and died in a very short time.

Treatment.—At first I treated each dog with alteratives and

tonics, treating special symptoms as they occurred, regulating the diet, etc. To Waler I gave taraxacum, with, for a time, excellent effect; I am, however, convinced that none of this treatment had any curative effect, but only served to prolong life. After I concluded that my dogs were suffering from a disease of a special form, due to the presence of micro-organisms in the blood, it was late to commence experimental treatment. I, however, gave Rattle carbolic acid and oil of turpentine, but without any beneficial effect. At that time Waler appeared to be improving under the taraxacum, till his final relapse, which was really a collapse, and gave no time for any special treatment.

I will now follow two cases throughout.

1. *Waler.*—On my return I found this dog sick nigh unto death, very emaciated and weak. The skin was in a curious state of disease; great irritation; portions of the body were nearly hairless, especially the limbs, the front of the chest, and about the ears. The feet were swollen and tender, and the dog was hardly able to walk. He had been treated, and had improved under cod-liver oil. The dog was thoroughly domesticated, and he improved when I brought him to the house. The appetite was small. I put him on a course of muriate of iron, and gave him a diet of sheep's head and rice, occasionally giving him meal. The bowels were irregular, and occasionally blood was passed. I treated the skin with an ointment of which boracic acid was the active agent. The improvement was very gradual, and it was some time before the dog could walk a mile. I now gave taraxacum, which seemed to have an excellent effect; the dog gained in strength and spirits, and he lost the disease of the skin, but I could still see that he was not the dog he was, and it was remarkable how "aged" he was by the sickness. At a time when the dog might have been said to be convalescent came the fatal relapse.

On November 25th he took his morning exercise with me; on his return he seemed to be quite done up and refused a portion of his feed. In the evening he was feverish, and evidently a sick dog.

Nov. 26th.—The following symptoms were shown: high fever, 104°, painful evacuations of blood-coloured fæces, attended with violent straining. The dog was in a curious state of nervous excitement, bounding about, shaking the head violently; he was constantly snuffling, as if to clear the nostrils. I gave him some bread-and-milk, which he instantly rejected; and any attempt to swallow was attended by violent and painful retching; during the whole day he could keep nothing down. I gave him a sedative of Tr. Opii and Spts. Chlor. with brandy, which I repeated later on, and at 3 a.m., as there was a return of the nervous symptoms and retch-

ing, I was called and gave him another sedative drench, a full dose, which relieved him.

Nov. 27th.—The fever is lower, 103°, and there has been no return of the Dysenteric symptoms, but the vomiting and retching continue, and these are accompanied with violent paroxysms. I repeated the sedative, but that was immediately rejected, and violent convulsions followed drenching. I still thought, if this vomiting could be overcome, that there was hope, as the fever was less and the purging had ceased. I now injected, hypodermically, ten minims of solution of morphia, after which there was no retching for some hours, and at about 6 p.m. I was able to drench him with some sheep's head jelly with a teaspoonful of whisky, which he retained, and now remained quiet for some hours; however, this proved to be but temporary relief, for at about 9 p.m. all the worst symptoms returned, and the poor brute died, sixty hours from the first symptom of relapse.

With regard to the presence of micro-organisms, I examined the blood on several occasions during convalescence, and invariably demonstrated their presence, but found them in no great numbers till I examined the blood taken at the time I gave the first subcutaneous injection; they were then present in myriads.

Post-mortem examination, made about twelve hours after death, showed the rigor mortis was remarkable, and there was a very noteworthy dry and bloodless condition of the tissues. In order to examine the thorax I removed one of the fore-limbs, and in cutting through the large vessels I found them loaded with black blood, and the axillary artery was plugged by a fibrous slot. On opening the thorax I found a considerable amount of effusion; the lungs were congested, but showed no sign of acute disease. The stomach was inflamed and ulcerated in patches, as was also the lining membrane of the intestines. The intestines contained no ingesta, but a small quantity of yellow mucus. Neither the liver nor spleen showed any sign of mortal disease, although the liver was large and was congested. The spleen was of natural size. The kidneys were healthy. I examined, microscopically, blood taken from the lungs, spleen, liver, and brain, and detected micro-organisms in each, but it is remarkable that in neither instance were they present in anything like the numbers in which I had found them in blood taken superficially from the skin. The heart was large, and there was considerable effusion into the pericardial sac.

(*2*) "Rattle."—On my return I found that this dog had been sick, but had improved, and was not now considered a sick dog, but still he was poor in condition and had no life in him. The appetite was fair, the coat was unhealthy, and there was a loss of hair very similar to that which I have described in the case of

"Waler." For some time this dog showed no special or urgent symptoms, but although he fed fairly well, he continued to lose condition, and the skin became more unhealthy, and latterly became œdematous; small sores broke out about the limbs and head, discharging a thin sero-sanguinolent matter. This case rapidly terminated fatally. Diarrhœa set in, which became Dysenteric; the dog fed till within twelve hours of his death, when vomiting set in, but there were no brain symptoms in this case, and the dog died quietly. It was in this case that I at first observed the micro-organisms, in blood taken from the elbow.

Experimental Inoculation.—Having demonstrated the presence of micro-organisms in the blood, and being in doubt as to their significance, I obtained a pariah pup and inoculated him with blood taken from the dog "Rattle," with the following result:—

The inoculation was carefully made, by simply inserting a lancet charged with blood beneath the skin on the inside of the thigh. There was a rise in the temperature on the fourth day after inoculation, on the seventh, and again on the eleventh, twelfth, thirteenth, and fourteenth, after which there was a fall till the seventeenth day, then a slight rise till the twenty-first day, and finally a great rise on the twenty-third day, then a sudden drop of no less than 6° prior to death, which took place on the twenty-sixth day after inoculation. I repeatedly examined blood taken superficially from the skin, and found micro-organisms; on the twentieth day, just before the last rise in the temperature, they were present in myriads. I also found them in the blood taken from the jugular vein after death, but not in the numbers I had seen them in the blood taken from the skin during life.

At first the pup was well, and really improved in condition; this was doubtless due to the regular and clean food he now received, and I do not suppose he ever had a real meal given him before. When the temperature at first rose there were no other symptoms of ill-health, but subsequently there was an unhealthy look about the pup, and he partially refused feed. After the last rise in the temperature there was a sudden collapse; he lay down, and was unable to rise, and seemed in pain, crying out when touched, and he continually snapped in a delirious manner.

Post-mortem examination, made immediately after death, showed the tissues to be in the same dried up state as described above; there was considerable effusion into both the thorax and abdomen; no disease of either lungs, liver, or spleen; the intestines were empty, and showed no signs of specific disease.

Remarks.—I have throughout spoken of "micro-organisms," and I have done this advisedly, till I am able to determine their true nature. I am, however, convinced that these organisms are

pathogenic. The disease is shown to be inoculable with blood containing these germs; it is also contagious. There was an absence of disease of the liver or lungs, which is noteworthy, as in cases of prolonged sickness in dogs, in this country, I have found, *post-mortem*, the liver usually to be extremely diseased, and often disease of the lungs to be the immediate cause of death. In all cases the mucous membrane of the intestines was affected; in two, and also the inoculated pup, brain symptoms were a marked feature. There are many symptoms in this disease which will in a great measure be found to resemble those of "Surra," investigated by Dr. Griffith Evans and V.S. J. H. Steel. (I forwarded my notes to these officers, and have to thank them for their kindly assistance.) The character of the micro-organisms, however, precludes this disease from being classified with "Surra," neither is it "Anthrax." If we are driven to the comprehensive term "Distemper," I fear it would be rather to hide the lack of knowledge of its true nature. I would define the disease as an inoculable and contagious disease of the dog, affecting animals of all ages, the urgent symptoms of which are progressive, and marked by extreme emaciation and debility, Diarrhœa and Dysenteric symptoms, and in some cases acute nervous symptoms and delirium, remarkable for its excessive mortality, the blood containing micro-organisms, which are probably the cause of the disease.

In recording these observations, I must explain that the investigation is very incomplete, for two chief reasons: first, that I did not earlier recognise that I had an obscure specific disease to deal with; and secondly, that all my dogs having died, a stop was put to further investigation. I trust, however, that these notes may prove a basis for further inquiry.

P.S.—Since writing the above, it has struck me that we may find a probable source of infection in the village pariah. Many a sickly, starved, mangey animal do we see about, and my dogs have been responsible for the death of many a one. I will endeavour to follow this idea up.

"BLACK LEG" IN CATTLE ABOVE TWO YEARS OF AGE.

BY JOHN BRETT, M.R.C.V.S., MANSFIELD WOODHOUSE, NOTTS.

MR. GRAY is quite correct in his assertion that stock owners believe "Black Leg" never attacks animals over two years old, although the contrary is pretty well known to members of the profession who have seen much of the disease. Some districts are quite free from it. I was in Kent in 1886, when Mr. Cooper, of Dover, a very able and careful man, with a long experience, assured me he never met

with a case; if my memory serves me aright, he said he had never met with one in his practice.

During the years Mr. Gray mentions, a number of deaths occurred in Notts amongst aged animals; one dairy farmer lost several cows, all above five years old. The district to which he refers has never been free from the disease, to my knowledge, for the last twenty-five years; on some farms the annual losses have been most serious. A practitioner never hears of a tithe of the fatalities, as the cattle are frequently found dead. No further notice is taken, except to remove the skin and leave the carcase lying about in the stack yard or some other place equally accessible to dogs or other animals. A brook is often a favourite place of disposal; the manure tank is frequently used as the general farm mortuary. The idea is that everything is dissolved by the liquid, and the manure thereby improved; undoubtedly its fertilising properties are increased, but what about the micro-organisms?

On one of the largest and best managed stock farms, in other respects, in Notts, this system was carried out foryears, and the liquid distributed over the grass land as occasion offered. What were the results? Black Leg and Abortion amongst cattle was the bane of the farm. The latter occurred at almost regular intervals as far back as I can remember, and is probably going on to some extent at the present time; upwards of a score aborted every year, either in the spring or autumn. Every cause was assigned but the right one. Black Leg would have decimated the herd had not a rigid system of preventive treatment been adopted. Every now and then those efforts would be relaxed from oversight or carelessness, with what results? Deaths were sure to occur. Numerous experiments were made from time to time, and a plan was hit upon at last which, when conscientiously carried out, gave the most gratifying results. Had the pathology of the disease been better understood, more care would have been taken with the disposal of the carcases after death. Unfortunately, farmers will not recognise its contagious character, and still look upon it as a dietetic disease, although repeated experiments have shown to the contrary, and the knowledge thus gained disseminated far and wide.

FIRING BY PYRO-PUNCTURE.

BY GEORGE T. PICKERING, M.R.C.V.S., YORK.

I WAS glad to see in the VETERINARY JOURNAL for March some remarks on the above subject by Mr. T. Flintoff, A.V.D.

I have obtained in many cases treated by pyro-puncture during the last few years, some very good results.

Some time ago I was requested to see a hunter, the property of

a gentleman. He had ridden him out one morning to hounds, and the ground being too hard, there was no hunting. When coming home with a friend or two, they had a race on the grass for about half a mile; the consequence was that the horse, being hardly up to the rider's weight, broke down on both hind legs, severely spraining and rupturing both suspensory ligaments, the near hind being the worst. The horse was so lame that he could scarcely travel. When he reached home he went down in the box, and could not stand for a day or two. When I saw him he was suffering great pain; the near hind fetlock was nearly on a level with the heel, and the off one had given way a good deal (both suspensory ligaments were ruptured). After hot fomentations, rest, and high-heeled shoes, etc., and the inflammation had subsided, I fired them by pyro-puncture, and blistered them well; and after re-blistering them two or three times, the horse got perfectly sound and worked well.

For splints, I think there is nothing better. I have a horse now that I have been working for some time. When I got him he had a large splint the size of the top of a hen's egg on the near fore leg, about two inches below the knee. The man I got him from used to ride him in a boot. I fired and blistered the part well, one deep puncture into the splint, and applied Hydrarg. Biniod. (1 to 6). The splint has almost entirely disappeared. I can hunt, hack, or drive him without the slightest fear of his touching the part with the opposite foot, which he used to do frequently. He is an aged horse, and I suppose the splint had been there some time.

I could mention numbers of cases in which splints have entirely disappeared under this treatment.

For curbs, I know of no better treatment—and I have tried a good many—than the high-heeled shoe, and after fomentations, etc., to reduce the inflammation, and when this has entirely disappeared, pyro-puncture and blister. I generally make one or two pretty deep punctures over the curb, and apply Hydrarg. Biniod. (1 to 6) well rubbed into the puncture, and rub a little blister (Hydrarg. Biniod. and Cantharid. of each one part to excipient 16 parts) round the parts. I can speak highly of this method of firing in side-bones, spavins, severe sprains, ringbones, chronic foot lameness, contracted feet, etc.

Where I fire one horse by the bar-firing, I fire six by pyro-puncture.

We all know that we are seldom called in to treat splints, curbs, etc., until the various blisters, liniments, and the different patent applications have had a good trial.

Not that I recommend firing for every case, but as a last resource, when other means have been tried and failed, I think there is

nothing better than firing by pyro-puncture, and applying a good absorbent.

The following are its advantages over bar-firing :—

1. It does not blemish.
2. Is more effectual, and more easily done.
3. No sloughing of the skin, and it acts only on the part required.
4. Deep structures are more easily reached.
5. Effects of absorbent more marked.

I think in private practice we should get more cases to fire, as the farmers and dealers would have more horses fired but for the marks left by the bar-firing.

Having given it a good trial for some time with such satisfactory results in almost every case, has led to my making these few remarks in this valuable journal, practically demonstrating the value of the treatment suggested by Mr. Flintoff, A.V.D.

THE GENERAL SANITATION OF STABLE BUILDINGS.

BY FITZPATRICK EASSIE, M.R.C.V.S., LONDON.

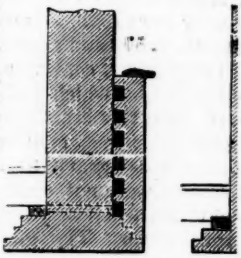
I WAS invited, a week or two ago, to contribute an article on the above subject to a sanitary periodical, and the idea subsequently occurred to me that an extended review of the same subject might not be out of place in the columns of the VETERINARY JOURNAL. The necessity of hygienic surroundings for the maintenance of ordinary health, and the retrogression in development dependent upon contrary conditions, have, during the last couple of decades, become almost a by-word in progressive medicine. In the breadth of medical and veterinary literature the necessity for the application of sanitary principles is constantly insisted upon. The comparative paucity, however, of written matter dealing with the technical side of the question as applied to the stable is my apology for venturing to submit to the notice of the profession these paragraphs, however indifferently they may be strung together.

Damp.—The first question that naturally presents itself to one's mind, with regard to the general sanitation of stable buildings, is the adoption of precautions against *damp;* and it is a matter which must be attended to at the very foundation of a building. To get an adequate idea of the importance of this subject one has only to start with the legitimate hypothesis that one of the commoner bricks is capable in itself of absorbing upwards of half a pint of water, and then to erect, as it were, a mythical edifice to contain, say, 22,500 of these bricks. Now, provided that such a

building were sufficiently low-lying—and by capillary action water will thus attain in a wall to a height of thirty feet—our building might readily contain 2,800 gallons of water, or fourteen tons by weight. It is unnecessary to suggest to the professional mind the army of coughs and colds and rheumatic affections that such an amount of moisture would probably give rise to, nor to point out the potency of such a constant adverse influence as predisposing to diseased conditions in general.

Dampness of walls is likewise traceable to the action of *driving wet*, but not to the extent of the other derivative. *Rising wet* is intercepted by the interposition of impervious materials, the building of hollow walls, and the erection of *damp courses* and *dry areas*. Asphalte plays an important part in all these ideas, but all kinds of patents are existent for coating the external surface of foundation-walls, which claim for their object the arrest of damp. Slates built against the wall and cemented with asphalte are very effectual, but properly built damp courses are naturally the best.

HOLLOW WALLS AND BONDING BRICKS.



DAMP COURSE.

Bricks of a better quality are less porous, and therefore a better protection against *driving* water; but a stable which is much exposed should possess a double wall, joined by perforated *bonding bricks*.

Drainage.—It is now generally conceded that surface drainage is quite adequate for stable purposes; but, for the sake of argument, we may with advantage establish a working hypothesis whereon to prove the lack of necessity for the elaborations of an underground system, were it only for the sake of comparison. The object of drainage in the stable is plainly the removal of urine and surface water *alone*, because the solid material is never under any circumstances admitted to the drain. The solid fæces are, on the contrary, removed by surface means—that is to say, by the aid of the broom and basket—to a suitable dung-pit.

It is convenient for our argument to consider, firstly, the selection of a suitable paving material, as upon this depends, in a great measure, the success of the system we would advocate. A good stable flooring, to commence with, must afford a good *foot-hold*. It must be durable and impervious to moisture, otherwise the subsoil will soon become a reservoir of decomposing fluid. It should, further, possess the quality of being readily cleansed; and lastly, it ought

not to be too costly. The paving which is perhaps most commonly in use is made up of blue Staffordshire clinkers, and the main feature of this pavement is that its surface is marked throughout by parallel V-shaped channels, which cross each other at right angles. These markings constitute the only drawback to this form of stable flooring, and that because they cannot be swept in two directions at once. For this reason the paving is uncleanly. Macadam, cobbles, and wood are obviously inappropriate; whilst slabs of stone or granite, besides being slippery, are certain to tilt. The small yellow bricks, laid "herring-bone" fashion, make a very good flooring indeed, and are thoroughly to be relied on, but *Williamson's cement* is the ideal stable pavement, and wherever it has been laid down it has given the utmost satisfaction.* It can be used alike for surface and underground drainage, but its chief recommendation is that by its use can be avoided not only the fitting of underground pipes, but the fixing of surface channels of iron or *terra cotta*, because of itself it is capable of being impressed into channels, and sloped and moulded at will. When the cement is being laid a central broad channel is depressed in the passage of the stable, which inclines until it delivers over a gulley in the yard. Into this broad groove a system of feather-planned channels incline from each stall or box, with the result, of course, that all surface water gravitates to the lowest point. For surface drainage, if cement were not employed, metal conduits would be necessary, and these, when they are used, should be open and preferably of wrought iron. The great virtue of surface drainage is its open character, as opposed to the hidden workings of an underground drain, which, like its vital prototype the intestine, is subject to many disorders, and equally difficult of remedial treatment. On the other hand, however, a selection is not always a matter of preference, and it may very well happen that it would be less expensive to make some necessary alterations in an existing underground drain than to abolish it and resort to the surface method. The general idea of this paper is less to deal with the perfections of an ideal stable than to suggest the remedies proper to a defective one, so that notwithstanding the fact that we regard the above system as that which is the simplest, cheapest, and most cleanly method extant, we will proceed to deal with the several materials which collectively form an underground drain; and we are not without a hope that at the termination of our brief survey we may have successfully inoculated admirers of drain-pipes and syphons with a belief in the simpler method.

* Wilkinson's concrete has not proved so satisfactory in troop stables as Wilkes', the latter having iron slag for its base, the former crushed granite. —Ed. *V. J.*

The remotest ancestor of the modern glazed earthenware drain-pipe was a wooden contrivance—to wit, the lumen of a hollow tree. As far back as the time of Xerxes, earthen cylinders were in use as drain-pipes. The ancients, however, notwithstanding their general progress, were not particularly strong on sanitary matters, and, in fact, it was left to our immediate generation to adopt the principle of the syphon as a "trap," which has since become of such importance.

The first essential in drainage is that the drain should be perfectly water-tight, and to ensure this many improvements have been made with regard to the joints; but in order to further guard against the possibility of leakage, it is now customary to cement the joints and lay the whole drain in concrete. This latter provision further serves as a solid, impervious foundation for whatever kind of pavement is subsequently used.

With regard to fall, three inches in ten feet is the minimum incline at which a stable drain should be laid.

A trap is a *syphon* containing water, and its function is to arrest, by the aid of this water seal, the passage of gases is a given direction. Traps are inserted at the terminations of the drain, in the stalls, and under all gratings, for the purpose of intercepting drain air from the stable. A trap is likewise inserted in the drain before it reaches the sewer, to cut off in a similar manner gases generated there. This particular trap is further modified to perform a function to which we will subsequently refer. The atmosphere of the stable is thus twice trapped from the sewer, and once from the drain. Were it not for this provision, the very gas burnt in the stable would be dependent in part for its combustion upon oxygen derived from the sewer.

The traps located in stalls are variously described as "horse pots" and "mare pots," according to their position, and in a many-stalled stable this arrangement is generally alternative.

(*To be continued.*)

HORSE-SICKNESS AT MASSOWAH, NORTHERN AFRICA.

BY G. CONTI, V.S., ITALIAN ARMY.

This disease was observed amongst the horses of the Italian Army of occupation at Massowah, the symptoms being the following: Great debility, and from the commencement loss of appetite; dry skin and injected mucous membranes, the conjunctiva irritable and covered with petechia, very much swollen and tumefied, so much so that it almost covers up the whole eye. The tongue gradually becomes swollen and dry, assuming a blue colour, with desquamation and

deep ulcers, if the case lasts long enough. The same lesions are visible on the buccal membrane, which exudes a quantity of serum tinged with blood. The lips, head, lower part of the neck, thorax, and limbs become swollen with an œdematous infiltration. Respiration is difficult and distressing, the nostrils being widely dilated. As the disease advances the animal becomes in a highly nervous state, with a dry, painful cough, and a profuse white discharge from the nostrils, which sometimes assumes a green or yellow colour. Cerebral symptoms, with vertigo or coma, are sometimes observable. The usual duration is from one to fifteen days, but it is most irregular in its course—what, to all appearances, is only a slight case assuming a most severe character in a very short space of time. Cases that recover remain convalescent for a long period. The cause of the disease is unknown, but the drinking-water is supposed to play an important part in its production. The mortality is much greater amongst horses than mules.*

The question that arises is, Is not this the same as the Horse-sickness of South Africa, the relative position of the two places north and south of the equator being much the same? In the report on Horse-sickness in South Africa I published in the VETERINARY JOURNAL some time ago, I pointed out that in Equatorial Africa there appeared to be an unhealthy zone where equines could not live, and that this decreased to the south. I also pointed out that Natal appeared to be on the border-land of the unhealthy equatorial regions and the healthy and cooler climate of the Cape Colony. May not the same condition of things exist to the north of the line as the south? Conti's description closely resembles the "Dikkop," and continued or bilious form of South African Horse-sickness in many particulars.

JOSHUA A. NUNN, F.R.G.S., F.R.C.V.S.,
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A PRESERVED (AND MODIFIED?) VIRUS OF BOVINE PLEURO-PNEUMONIA.

BY J. CAMMACK, M.R.C.V.S., KIMBERLEY, SOUTH AFRICA.

ON 22nd September, 1888, an old cow, worn out by and dying from Pleuro-pneumonia, was shot, and the carcase was thoroughly drained of blood. Cotton wool (non-sterilised), saturated with the fluids from lungs and chest, was dried in the sun and wind; more than six weeks later calves were inoculated with the dried wool. They "took," and did well.

This virus-holding wool was kept, in the interval, in a hot, dry atmosphere, "on the top of the clock," in a farmer's sitting-room.

* *Recueil de Médecine Vétérinaire*, Nov. 15th, 1888.

Editorial.

IS THE FLESH OF TORTURED ANIMALS POISONOUS AS FOOD?

THE idea has been recently started, or rather revived—for it is somewhat ancient—that the flesh of tortured animals may be pernicious as food; and as it has received the support of medical men, it is possible that it may engender alarm in the minds of nervous people who are easily roused to a sense of danger with regard to matters connected with food, drink, and air. It is notorious that creatures whose flesh is consumed by man, often undergo torture or great distress through fear, before they are killed; indeed, some of them, as deer, are purposely hunted and excited immediately before death, in order to endow their flesh with that gamey flavour so much esteemed by *gourmets*. Whether it really does so, is a question we cannot pretend to answer; but the popular notion that it does would fortify the presumption referred to, that some change does occur in the tissues under the influence of pain or distress. A medical man at Lancaster lends his countenance to the poisonous character of what he designates "tortured meat," and he evidently thoroughly believes that there is danger in its consumption. A toxic product is developed in the flesh of tortured animals, he asserts, one of the class of peculiar bodies known as "ptomaines," some of which are not destroyed at the temperature of cooking, and which, he contends, are undoubtedly produced under conditions of great pain and distress. Before such a statement can be accepted, stronger and clearer evidence must be adduced than has hitherto been brought forward. He can only give one instance from his own experience, to support his contention. It is that of a gentleman who is always made alarmingly ill if he eats trapped rabbit; three times he suffered so severely as to endanger his life before he discovered the cause, and yet he can eat shot rabbits without any disturbance at all. The doctor judiciously adds, that no doubt many people can and do eat of trapped rabbit without any apparent ill consequence, but he concludes that the danger still remains that some day or other, when they are unusually susceptible to the action of the poison, or owing to the poison being strong and concentrated, they will have a serious attack. Many cases of dangerous illness and death of unknown origin, he avers, may be explained in this and similar ways, and he entertains no doubt that some have been really caused by it.

Needless alarm in this direction is to be reprobated; there is already sufficient to occupy attention. The majority of animals suffer more or less torture before they yield up their lives for the sustenance of the lords of creation. The proof that this torture will render their flesh hurtful has yet to be furnished, and one or two instances of people offering symptoms of illness after partaking of a particular kind of meat, is no evidence that it possesses noxious properties. In fact, the idiosyncrasies of individuals in the

matter of food are extraordinary, and a curious chapter might be written on the peculiarities or susceptibilities of people. To these exceptions, rather than to the formation of ptomaines in the tissues or fluids of terrified animals, we would be more inclined to ascribe such effects as have been recorded. Wild, and even domesticated carnivorous creatures eat the flesh of tortured animals with impunity. What an amount of torture does a mouse undergo before it is devoured by the cat; and yet no one has committed himself to the statement, so far as we know, that cats have suffered from illness or have died, owing to the action of ptomaines developed in the bodies of their victims, immediately before these had succumbed to a protracted agony.

THE AFRICAN "HORSE-SICKNESS."

In previous numbers of this Journal, allusion has been made to the above subject in connection with the reports upon it by Mr. Nunn, two of which have been published in its pages. These reports have now been issued as a Blue-book of the War Office, with the addition of plates, maps, and plans. They are prefaced by the following remarks from the Principal Veterinary Surgeon of the Army, addressed to the Adjutant-General, General Viscount Wolseley, K.P., G.C.B., and may prove interesting to our readers as a summary of our knowledge of this destructive malady.

My Lord,—I have the honour to submit, for the information of His Royal Highness, the Commander-in-Chief, the Right Honourable the Secretary of State for War, and the Right Honourable the Secretary of State for the Colonies, three reports from First Class Veterinary Surgeon J. A. Nunn, F.R.C.V.S., Army Veterinary Department, on the destructive disease that appears among horses in certain parts of the African Continent, and which, in South Africa, is known to the English Colonists as the "Horse-sickness," to the Boers as the "Paard-ziekte."

In consequence of the diversity of opinion with regard to the nature of the disease, the great mortality it occasions, its terribly rapid course, and the impotency of all attempts hitherto made to cure it, my attention has been directed to it for some time.

In recent years it has been particularly destructive among animals employed during military operations in the Colony of Natal, and the official reports of the fatality attending its appearance, as well as the mystery which seemed to surround its development and progress, impelled me to request that a skilled Officer of the Army Veterinary Department should be sent to Natal to study the malady, in order to clear away the doubts that had always prevailed as to its origin and nature. And as an opinion had for a long time been entertained that it was Anthrax, I was hopeful that, if it proved to be so, Pasteur's method of protecting animals against that virulent disease, by inoculation with cultivated virus, might be made available in preserving those of the Army, as well as those belonging to the Colonists, from a pestilence which is not only serious from a military point of view, but constitutes a positive drawback to colonisation: sometimes sweeping off, as it does, nearly all the horses and mules over wide districts during the season when it prevails. A preventive measure of this kind, it was considered, would prove an immense boon to South Africa.

The importance of such an inquiry as was contemplated, when it was suggested that a well-skilled and specially-trained Veterinary Officer should

undertake it, could scarcely be overrated if these considerations are taken into account; and its importance was also manifest when the history of the disease—chronological, geographical, and medical—was reviewed. I may be permitted to refer briefly to this, before further alluding to the reports now submitted.

Dr. Scherzer, in his narrative of the voyage of the Austrian frigate, "*Novara*," gives a very concise account of the malady, from which I transcribe the following passages in support of my statement. He writes:—

"During our residence in the Cape Colony (1857), severe depression existed among the agricultural inhabitants of the western and eastern districts, in consequence of an epidemic which, within two years, had carried off 64,850 horses (draught horses, mares, and foals) of the value of £525,000 sterling. Many landowners, in consequence, entirely gave up rearing horses, and turned their attention almost exclusively to the breeding of sheep. The visitations of this malady are by no means of late introduction, but hitherto they have made their appearance at such long intervals, that but little attention has been paid to them, and people regarded their return without much alarm. This disease of the horse, usually endemic (enzöotic) in Cape Colony, assumed, every twenty years owing to some inexplicable causes, an epidemic (epizöotic) character, and, on those occasions, extended over an extensive area, as happened with extraordinary regularity in the years 1780, 1801, 1819, 1839, and 1854. Hitherto, no further precaution was taken than, as soon as the disease appeared, to drive the horses from the grass pastures to their stables or covered sheds, and there supply them with fodder, the night dew being considered a main cause of the complaint.

"A resident in Stellinbosch, indeed, maintained, that the dew which was deposited during the continuance of the disease, tasted quite bitter, and was of an unusual brownish tinge. Singular to say, not the slightest symptoms of illness manifested themselves in the swine, dogs, and birds of prey which devoured the carcases of horses that died of the disease. Considering the importance of the subject to a land-holding colony, it could hardly fail that numerous individuals should devote themselves to elucidating the causes of the devastating epidemic; but it must ever remain a striking and significant fact, illustrative of the high standard of cultivation in Cape Colony, that within a few years, 112 different authors published treatises respecting the complaint among the horses. The result of these numerous researches was, that the malady is epidemic (epizöotic), but not contagious; that horses driven into the stable before sun-set, and not permitted to go out to pasture, are, as a rule, exempted from attack; that those horses which are kept at night in open grounds, or in places where there are heaps of dung, take the disease in a milder form than if suffered to roam at large day and night; lastly, that horses for which no covered shelter can be provided, may, with great advantage, be sent to hilly localities and dry runs of land.

"The practical remedy which was most resorted to, consisted in immediate and prolonged bleeding, pushed to actual exhaustion of the animal, in the first stage of the disease."

From all accounts, the disease only attacks solipeds—horses, asses, and mules; and during severe outbreaks, zebras and quaggas have been found dead in their native haunts, with the characteristic masses of foam protruding from their nostrils. Ruminant animals appear to be altogether exempt from visitations; so that while horses and mules are dying on every side, cattle, sheep, and goats, as well as camels, graze in the same localities at the same time, with absolute impunity, so far as this malady is concerned. Carnivorous animals eat the flesh of horses which have died from the disease, and suffer no ill effects, and it cannot be produced by inoculation with any of the products derived from diseased solipeds.

The influence of locality in its production is very marked. It prevails chiefly in low-lying districts or "vleys," and is rare indeed in elevated localities. Season, too, has a remarkable influence in its development, summer being the time of year in which it manifests itself, and with the onset of winter it disappears. From the earliest times in the history of European colonisation in South Africa, it has proved a scourge to the settlers, and these peculiar features in its character—prevalence during summer, and sudden disappearance as soon as cold weather sets in, with its tendency to confine its ravages to low-lying regions—were well known to the primitive colonists at the Cape of Good Hope, who turned this knowledge to good account.

This is testified to by Burchell, the early South African traveller, who visited the Cape Colony in 1811. When at Roggeveld Mountains, near the then border of the Colony, he writes: "The Hantemberg, lying in the direction of N.N.W. from the Roggeveld Mountains, is said to be very high land, and is remarkable for being one of the few situations in this part of the country where horses are not liable to the Horse-sickness which rages during the summer season, and annually carries off great numbers." When speaking of the seasons at Klaarwater, he further remarks: "After the middle of October no frost is expected for seven months, but in the mornings of May it is always found to return, and is the signal for the return of their (the Boers') horses from the Roggeveld, whither they are sent in January, to avoid the Paard-ziekte, a fatal distemper to which they are liable in the hotter months. Those who object to send their horses to so great a distance from the settlement, are content to run the risk of keeping them in the Langberg, an elevated mountainous country, lying in a N.N.W. direction. This, however, not being so cold as the Roggeveld, is less safely to be depended on. It does not seem that the distemper acquires its full force until the beginning of February, but after then the lower districts of the whole of the extra tropical part of Southern Africa are, as far as my information enables me to speak, subject to its baneful effects. Experience has shown that the first frost, whenever it happens, fortunately puts a stop to its further ravages." And, again, at the same place in January, 1812, he remarks: "As the season for the Paard-ziekte was expected to begin, generally about the commencement of February, a party of people set out this day for the colony, taking with them a great number of horses, with which they were to remain till the first of May, at a farm in the Roggeveld, belonging to a Boer named Franz Moritz. Many of these people had this year sent more than half their horses into the colony; the other half, in order to be nearer at hand in case of hostilities with any of the neighbouring tribes, were sent off at the same time for the Langberg, under the care of a stronger party. In a former year, when they preferred running the risk of keeping their horses at the village in the Asbestos Mountains, out of eighty horses there died of this distemper not fewer than seventy. . . . They (the Langberg Mountains) appear to be very lofty, and it was said that on the other side there is little descent, the country continuing at the same high level, which fact, as the air must be colder there than in the lower plains about Klaarwater, has induced the Hottentots to keep their horses there during the season of the Paard-ziekte. There is also another elevated tract between Langberg and the Kloof, where horses also are kept, and which is therefore named Paardberg (Horse Mountain)."

Anderssen, in his book of travels (Lake Ngami), states in 1856:—"We had only been a short time at Richterfeldt (South-West Africa) when three of our mules and the remaining horse were seized with a mortal disease, and in the course of a few hours they all died. Though the loss of the animals was great to us, their death was a god-send to the poor Damaras, who devoured the carcases bodily, and without any disagreeable result. The distemper in

question is usually known by the vague name of Paard-ziekte; and as the cause is totally unknown, no remedy has yet been found efficient to stop it. Throughout Great Namaqua Land it is particularly fatal. Some people attribute this singular disease to poisonous herbs of which the animals have inadvertently partaken, and others, again, to the eating of the young grass; but all the suppositions are highly improbable for reasons which it would be unnecessary to enter into here. Fatal as the disease is to horses, yet happily there are places (even in districts where it commits the greatest ravages) that are always exempt from it. And as these localities are well known to the natives, if one's horses be sent to them prior to the commencement of the sickly season—usually the months of November and December—the animals invariably escape the malady. The attack of our animals was an unusual exception to this rule, for they fell victims to the disease fully a month prior to the rainy season. From the Orange River, on the south, and as far north as Europeans have penetrated from the Cape side, this deadly disease is known to prevail, and is one of the greatest drawbacks to successful travelling in South Africa. . . . Within Zwartboor's territory (Namaqua Land) was a mountain where horses might pasture throughout the year without being exposed to the Paard-ziekte, the cruel distemper to which these animals are subject. Almost all the Northern Namaquas, Jonker among the rest, are in the habit of sending their horses here during the sickly season."

It is probable that the disease has a wide geographical range in Africa, and that it will be found more or less prevalent towards the centre, and even towards the north; for Sir William Baker, in his work on the Albert N'yanza, describes it, or a closely allied disease, as killing his horses and mules during his progress to the source of the Nile. Livingstone refers to it in his travels in the interior; and the pestilence which destroyed so many of our horses and mules at Annesley Bay, during the expedition to Abyssinia in 1868, was, according to report, identical with this Horse-sickness. The Italian expedition to the same country, during the past year, has suffered severely from it at Massowah.

But it does not appear to extend to Eastern or Western Africa, so far as I can learn. It may be noted, however, that in Senegambia, West Africa, the French have lost many horses, especially those from Algeria, from malarial disease. M. Dupuy, Veterinary Surgeon to the Squadron of Senegal Spahis, in the *Recueil de Méd. Vétérinaire* for August, 1888, states that of forty-six Arab horses he saw disembarked at Kayes in 1885, thirty-three had succumbed in about three months. So long ago as 1863, the deadliness of the climate to imported horses was announced by the traveller, M. Mage ("Voyage au Soudan Occidental"), who observed that the generally received opinion in Senegal, that the Arab horse could not live in the "Haute-Fleuve," as the country is sometimes termed, prevented the Governor from placing the horses of the Spahis at his disposal as an escort. The mortality appears to be due to two diseases. One is as rapidly fatal as the Horse-sickness of South Africa, and only attacks the Algerian horses, leaving the small native ponies, and the mules and asses from France, unharmed; it is prevalent every year, exercising its maximum ravages towards the termination of winter, when the inundated regions begin to dry. It affects isolated horses, as well as those living in troops, attacking sometimes the old before the young, and appearing as frequently among those kept in the open air as in sheds. This form has been compared to the pernicious malarial fever of man, and indeed has been so designated in the horse (*Fievre paludéene pernicieuse*). The other form is more like the intermittent fever of mankind, and though equally fatal, has a slower course than the last. It sometimes attacks indigenous horses, and it is marked by persistent elevation of temperature, with remissions, which are soon followed by paroxysms. After death the liver and spleen are found to

be greatly increased in volume, the blood is watery, and the lower part of the limbs and body is swollen by serous infiltrations. In the first form there are similar changes noted. The liver is excessively enlarged and friable; the spleen is also much larger than natural; the blood is dark, and in contact with the air it does not redden, while it leaves a violet stain on the hands; the lungs are pale throughout and rather resist pressure, the inferior portions having a yellowish tinge and gelatinous consistency, and after section an abundance of yellow foamy fluid can be expressed from them.

These malarial diseases of the horse are special to the "Haute-Fleuve," where the soil is clay, and the whole country more or less marshy during the winter. In Lower Senegal, in the Cayor region especially, where the soil is sandy and arid, and where deep wells have to be dug for water, they are not seen, and Algerian horses thrive well.

The Nomadic Moors who frequent the right bank of the Senegal river, and who devote themselves to rearing cattle and horses, always retire from this malarial region to the interior when the rainy season sets in.

It may be further remarked, that when the surface of the ground is freshly broken in this sickly country, in order to form camps, the fevers among the horses are always more prevalent and severe.

Of late years, the South African Horse-sickness has been brought more immediately and impressively under my notice, in consequence of the heavy losses it occasioned among army horses and mules in Natal, and the embarrassment it occasioned to military operations; and notwithstanding the excellent reports upon it, furnished by officers of the Army Veterinary Department serving in that Colony, and notably those of Inspecting Veterinary Surgeons Gudgin and Lambert, and Veterinary Surgeons Duck and Rutherford—I was not satisfied as to the nature of the disease, nor yet as to the measures necessary to protect animals from it, or to cure them when attacked.

In order to arrive at a correct knowledge of these, and also to test the value of the latest discovery in preventive medicine, with the view of checking the ravages of Horse-sickness in our African possessions, I suggested to His Royal Highness, the Commander-in-Chief, the desirability of sending a competent veterinary officer to make the necessary investigations in Natal. First-class Veterinary Surgeon J. A. Nunn, F.R.C.V.S., was recommended, because of his special fitness for the task, and particularly because of his experience in dealing with destructive horse and cattle diseases in the North-west Provinces of India, where he gained an excellent reputation. On being appointed for this duty, he underwent a special course of training in microbiology at the Cambridge Pathological Laboratory and at the Brown Institution, London, after which he went to Pasteur's laboratory, in Paris. Provided with the necessary apparatus, he at length embarked on December 10th, 1886, furnished with the following instructions:—

"The object of the proposed investigation is to ascertain the nature, causation, and prevention of the fatal disease known as Horse-sickness in South Africa. For this purpose the investigation should be carried out in the following manner, or as near thereto as circumstances will permit:

"1. The investigator should locate himself in a district where the malady is most prevalent and fatal (Pietermaritzburg, in Natal, seems to be most suitable), and during the season when it is general (the South African summer).

"2. As the disease is undoubtedly due to a micro-organism, the source of this should be sought for in the soil, the dew, and the food and water which horses receive. As the malady chiefly attacks horses and mules allowed to graze after sunset and before sunrise, the germ will probably be discovered primarily in the dew or grass, probably in both. To decide whether any

organism so discovered is really the cause of the disease, it must be cultivated in a suitable medium, then introduced into the body of a susceptible animal, either by the stomach as in feeding, or through inoculation, so as to produce the disease in it, at first; then in other susceptible animals, by transference from the one primarily infected.

"3. The mode in which the organism obtains access to the body should be ascertained, if possible; whether through the lungs in respiration, or through the stomach in eating and drinking.

"4. The organs of the body in which it more particularly localises itself.

"5. The symptoms, course, and *post-mortem* appearances of the disease in animals affected with it, either (*a*) accidentally, or (*b*) experimentally.

"6. The geographical extent of the disease, and the physical and geological features of the districts in which it prevails enzöotically.

"7. The most certain and ready methods of prevention of the disease, with regard to (*a*) the general management of horses and mules, and (*b*) protective inoculation.

"8. As it is probable that inoculation must be considered the only sure means of protecting solipeds from the malady, by rendering them proof against it, in regions uninhabitable by horses and mules during the hot season, special attention must be directed to this point, with reference to the safest, most certain, and simplest method of modifying or attenuating the virus of the disease for inoculating purposes; whether by previously passing it through the body of some other species of animal, by cultivating it artificially, by diminishing its virulency by heat, or by any other simple yet effective method.

"The best method of inoculation of the animals to be protected (seat and mode of introduction of the protective fluid) must also be ascertained, so as to ensure the safety, success, and ready application of the measure. The duration of the protection so afforded, whether permanent, or, if only temporary, should, if possible, be ascertained; though this may require one or more years.

"9. If immunity from the disease is afforded by this protective inoculation, then should be considered the manner in which the inoculation decided upon can best be carried out in the regions where the Horse-sickness prevails; and this not only with regard to Government animals, but also those of the Colonists.

"10. The assistance of the officers of the Army Veterinary Department in South Africa will be given, if required, in carrying out this important investigation; instructions to that effect having been forwarded to the Senior Veterinary Surgeon in Natal. A request has also been made to the South African Governments to render assistance if required.

"11. Incidentally and concurrently with the carrying out of this investigation, inquiry might be beneficially instituted with regard to the other contagious diseases affecting the domesticated animals in South Africa; not only those employed for Army purposes, but those also belonging to the Colonists, and more particularly with respect to their prevention by protective inoculation.

"12. A detailed report on the whole should be drawn up and forwarded to the Principal Veterinary Surgeon, to whom interim reports should be made on the progress of the investigations."

Arriving in Natal on January 5th, 1887, Mr. Nunn commenced his investigations in Pietermaritzburg a few days afterwards, a case of disease having occurred there on the 11th of that month; and working until the end of the summer (African), he arrived at certain conclusions, on which he based an interim report. These conclusions, as shown in this report, were to the effect

that the Horse-sickness is not Anthrax, and that the micro-organisms found in the fluids and tissues of the affected horse are very different from those of that disease.

In order to complete his investigations, he was directed to remain in South Africa for another year; and during the winter months, when the disease does not prevail, he proceeded to make an inquiry into the horse supply of the country, in the course of which he travelled more than 8,000 miles in Natal, the Cape Colony, and the Free State. His valuable report on this subject has been already submitted.

In the following Horse-sickness season (1887-88), he resumed his researches into the nature of that malady, and transmitted a final report in June.

It is these two reports in particular which I now beg to lay before you. I may observe that they possess much interest, from a scientific point of view, the results arrived at in the first report being confirmed in the second.

Mr. Nunn, following the directions given, set himself first to prove the nature of Horse-sickness. He has succeeded satisfactorily, I think, in demonstrating that, contrary to the opinion of the majority of observers, the disease is not Anthrax. This I had myself previously doubted, because of the fact that during the most serious outbreaks of Horse-sickness, cattle and sheep could graze with safety on the same pastures with the horses. This is not the case in Europe and other countries—as Russia—in those regions in which Anthrax is so destructive; there the mortality among cattle and sheep is much greater than among horses. Anthrax is nevertheless known in South Africa, and Mr. Nunn in his reports alludes to it, and shows in what respects it differs from the Horse-sickness. The chief distinction appears to be, that whereas the former is readily inoculable, and in other ways transmissible to other creatures, the latter is not. Mr. Nunn discovered a micro-organism or bacillus in the Horse-sickness blood, in the foam issuing from the nostrils, and in other fluids and tissues of the body; this bacillus differs in several morphological particulars from that of Anthrax; any introduction of it in various ways, into healthy animals, was followed by negative results.

I may here observe that Mr. Nunn recently sent to England for examination, blood and other matters from horses which were affected with Horse-sickness. These have been examined by Veterinary Surgeon F. Raymond, F.R.C.V.S., Army Veterinary Department, who reports as follows:—

"In some of the tubes I received there were as many as six and seven different microbes, which is probably due, in a great measure, to the fact that Mr. Nunn worked in the open air.

"From tubes I received, I made plate cultivations on nutrient gelatine, with a view to isolating more particularly bacilli resembling those shown in Mr. Nunn's blood slides.

"I will here state that I distinguished, in the slide sent me, two kinds of bacilli; one a short thick bacillus, the other longer and more attenuated.

"These two bacilli I succeeded in isolating and making pure cultivations of. No. 1, the short bacillus, grows very rapidly on gelatine, causing it to liquefy; a scum of a wrinkled, light, whity-brown colour forms upon the surface. In cover-glass cultivates, I noticed that the bacillus was rounded at both ends; it does not form chains, and varies in length from nearly a round shape to about eight times its breadth in length. On potato it grows very rapidly, covering it with a brown wrinkled growth, and giving rise to a somewhat unpleasant smell. This microbe bears a very strong resemblance to the common potato bacillus.

"Bacillus No. 2 is motile. On plate cultivations, seen under a low power, it very much resembles the mode of growth of the Anthrax bacillus; when examined under higher powers, it is seen to form beautiful chains, and in this respect, resembles the *B. figurans*, but it differs in its mode of growth on agar-agar. It liquefies gelatine, but not agar. The spore formation is very interesting, and here again a close resemblance to the Anthrax growth is noticeable.

"From cultivations in gelatine, I have procured some exceedingly long specimens, which curve in different directions.

"Besides these bacilli, I found other germs, which, as I failed to notice them upon Mr. Nunn's slide, I looked upon as contaminations. I mention them, because their presence accounts for the changes of colour which he reports upon his cultivations.

"I found—

A. Sareina = The yellow Sareina.
A. Torula = The pink yeast.
A. reddish micrococcus.
A. umber „
A. white „ (putrefactive).

"From material received from Mr. Nunn, I have sections of the liver, lungs, spleen, and kidneys. I found in each organ bacilli in small numbers, but they do not bear any striking similarity to those found in the blood. In the kidney I found some large bacilli. The general impression left on my mind is, that cadaveric changes had set up in the subject from which the specimens were taken."

In relation to this matter of germs, I may remark that, according to the *Giornali di Anatomia, Fisiologia, et Patologia*, for May and June of the present year, one of the Italian Veterinary Officers at Massowah sent to the Veterinary College at Pisa, Italy, some blood and portions of tissues from horses that had died of the malady prevailing amongst the expeditionary horses, and already alluded to. On microscopical examination of a portion of this blood (obtained from a mule fourteen hours after death), bacilli were found which measured from ·00285 to ·00570 mm. In some of these, clear spaces were seen in the middle, the point at which division would have taken place in the process of generation.

A few years ago, some fluids and tissues from horses ill, dying, or dead from Horse-sickness were sent to me from Natal. These materials were experimented with at the Brown Institution, London, and rabbits inoculated with them died in consequence. The symptoms and *post-mortem* appearances were very striking, and consisted chiefly of evidence of bronchial catarrh and sub-pleural exudation. Bacilli were found in the bronchial effusion, and the blood-vessels of the bronchi were sometimes filled with leucocytes. The pleura, as well as the mucous membrane of the bronchi, was thickened by an inflammatory or hæmorrhagic exudation. Bacilli were only observed at the seat of inflammation; long ones were found in the peritoneal fluid and blood. Sometimes they appeared to be passing through the walls of the vessels, but they did not occlude these as the bacilli of Anthrax do, and though they somewhat resembled the latter, yet they were not so numerous, and were more localised, as well as more slender. Their tenuity they retained when cultivated, otherwise they comported themselves like the Anthrax bacilli; which would go to prove that the disease is not identical with, but only allied to, Anthrax. The two diseases further resemble each other in their prevailing chiefly in damp or malarial regions, during warm or hot weather.

With regard to the exact nature of the disease, in some of its features it

bears a resemblance to Anthrax, and might therefore be classed with a few other animal plagues, which were until lately designated "Anthracoid," but which are now differentiated, and more especially through the dissimilarities discovered in the micro-organisms that characterise them. That it also is due to a specific germ there can be little doubt, and that this germ requires two conditions in which to develop its activity—the warmth of summer, and the moisture to be found in low-lying situations—is also evident, as then it becomes active; whereas in cold weather it is in a latent or resting condition, and in dry situations it does not find a suitable home. It might even be said that it demands a third condition to favour its development—rank herbage, or vegetation of a certain kind which facilitates the growth of grass.

The fact which Mr. Nunn relates with regard to the "Karoo bush," appears to support this in a very remarkable manner; the districts in the Cape Colony which were at one time uninhabitable for horses because of this disease, being now perfectly safe for them, through the introduction of sheep, which have eaten up the bush, and so altered the vegetation that the germs of Horse-sickness have disappeared. This is a most important observation, with regard to abolishing the scourge from the localities now haunted by it.

The sanitary measures adopted to prevent the disease appear to have been rather successful during the last season, and for the present it is these preventive measures which must be adopted, whenever possible, in order to keep horses and mules free from it.

In conclusion, I think Mr. Nunn has accomplished his mission to the best of his ability, and deserves very great credit for the manner in which, in a climate not very favourable for such investigations, he has pursued his scientific researches into the nature and causes of South African Horse-sickness.

TETANUS IN ANIMALS.

M. Nocard, director of the Alfort Veterinary School, recently drew the attention of the Academy of Medicine to certain epizoöties of Tetanus in private practice, affecting animals treated by certain veterinarians, whilst animals treated by other veterinarians remained unaffected. On the other hand, the inoculability of traumatic Tetanus cannot be seriously contested. It is sufficient to inoculate pus from a wound to render tetanic the greater number of animals susceptible of contracting the malady (guinea-pigs, rabbits, sheep, asses, horses, etc.). The author here observes that spontaneous Tetanus does not in any way differ from traumatic Tetanus; it is, therefore, probable that both have an identical cause. It is more difficult to interpret the *rôle* of cold in a large number of cases of Tetanus. It appears to be established that in cases of surgical Tetanus it is the instruments of the surgeon which convey the contagium to the operation wound; hence the clear indication for antiseptics. Since 1882, M. Nocard had performed seventeen complete necropsies of tetanic horses. Besides notable increase of the quantity of cerebro-spinal fluid, he found nothing abnormal. He thought that the tetanic virus is seated, like the rabic virus, in the nervous centres, but he had not been able to find the tetanic contagium either in the nervous centres or in the blood. M. Trasbot, of the same school, an ardent disciple of M. Verneuil, pointed to the fact that all muscular rigidity is not tetanic. Thus, the rigidity of animals overworked or suffering from fatigue—the malady of the deer, as it is called—disappears by rest. A deer, accidentally hunted and falling into the possession of the hunters, was completely immobilised by the stiffness of its limbs. The animal was not killed, and the next day the pseudo-tetanus had disappeared.

THE MAL DE CADEIRAS.

BY M. REBOURGEON, DIRECTOR OF COMPARATIVE PATHOLOGY, LABORATORY OF BELEM-PARA, BRAZIL.

In the *Recueil de Médecine Vétérinaire* for February, M. Rebourgeon describes a disease which appears to be special to the equine species in Brazil, where it is commonly known as "Quebra-bunda." It is characterised by feebleness in the posterior part of the body, and disturbance in the sensibility and motility of that region, its commencement being slow or rapid, and its progress sometimes insidious. Anatomically, the spinal cord appears to be chiefly involved, the attack being localised always in the anterior part of the lumbar enlargement; the circulatory system is also modified. It is enzoötic in certain regions, but it has a tendency to extend and become epizoötic. It is prevalent from 10° South to 20° North latitude, but it is seen chiefly in the equatorial region; its degree of longitude is much more extensive, and its focus appears to be the island of Marajo, comprised between 0° and 2° of latitude; though it is equally known throughout the basin of the Amazon, in the provinces of Parû, Maranhô, Cearû, Goyaz, and Matto-Grasso. It has also been observed in Panama, and farther North, even to Mexico.

The opinion is generally entertained at Marajo that the Mal de Cadeiras first appeared in 1834, after a great slaughter of horses, which took place at that time. A Franco-American Company had obtained from the Brazilian Government the privilege of trading in the hides obtained from the immense number of horses inhabiting the island, and slaughter-houses were established in different districts where the skins were procured. The carcases of the horses were left exposed to the weather, and underwent putrefaction in crowds, no disinfection whatever being resorted to. Rebourgeon does not sanction this opinion as to its origin, but is rather inclined to believe that the disease already existed, though cases were rare; and that when the number of horses had been considerably diminished, it became more noticeable because of its intense character, which allowed it to become rapidly propagated, and particularly because of the more numerous and pressing requirements of the Fazendas, or mail and passenger carriages.

Investigation did not discover anything in telluric or atmospheric influences in connection with it; it appears at all seasons of the year, and indifferently in regions wide apart. The stagnant waters in the midst of the *Campos* were carefully examined, but nothing in the shape of bacilli were found; and the dust on the surface of the marshes dried by the sun, and which adheres to the plants eaten by animals, when scrutinised, yielded the same result. The influence of excessive work, however, as well as of age, was notable. Many instances were recorded, in which, after violent exertion or over-driving, horses were attacked by the disease, but always in the acute form. Horses are more frequently affected than mares, and foals oftener than aged animals.

Though Rebourgeon does not lay much stress on the parasitic origin of the malady, he remarks that Professor Lacerda, director of the Laboratory of Comparative Pathology at the Museum, Rio-de-Janeiro, in a communication on Beri-beri, asserts that he found in the blood of people suffering from that disease a microbe, which he describes, and that he also discovered the same micro-organism in the medullary tissue of animals which had died of the epizoötic affection of Marajo—a circumstance which rendered the two maladies identical. Rebourgeon's investigations in this direction yielded only negative results, though, believing it to be a parasitic disease, he had instituted a complete bacteriological laboratory in the centre of the infected regions, in order to make a thorough examination of the fluids and tissues. He acknowledges that the scourge is due to an inscrutable morbid element, an infectious miasm or malarial poison, analogous to that of certain

influenzas, the intermittent and variable character of which does not permit any exclusive influence to be referred to the soil, regime, or labour. The explanation given by those who ascribed the origin of the disease to the infection arising from the putrefying animal matters resulting from slaughtering of horses, already alluded to, would be perhaps sufficient to account for the lesions observed, as the symptomatic manifestations of these degenerative changes are similar to those met with in infections due to decomposing animal matters. But, if this was the case, why is the malady not confined to Marajo? And why is it seen at Cearù, Maranhoa, and Matto-Grasso, which have no communication with that island?

The professor does not believe that the same cause exists everywhere; for it is rare that the horses of Marajo are purchased for service in the capital, and, nevertheless, numerous cases happen at Belem among animals from Sertaô, which is a district on the Continent. He thinks it very probable that a predisposing cause is the degeneration that occurs in the horses in these parts of Brazil, and which operates chiefly on the nervous system in general, nervous diseases being hereditary among them. The equine race is not indigenous to Brazil, for nowhere have there been found fossil traces of it; all is importation. The first horses came from Spain and Portugal with the early conquerors. A further importation was made about 1600, by the Mercenarius Monks, on their own behalf, and in 1664 their example was followed by the inhabitants of Parù, who brought all the animals they possessed from the Cape de Verdes. For two centuries no change has taken place, the horses interbreeding under the same conditions, no care being taken to prevent the evil consequences of this in-and-in breeding.

Though popularly believed to be contagious, the professor has doubts on the matter. The necroscopic lesions give no indication of its being so, and a microscopic examination of even the organs most affected is equally unsatisfactory. Besides, the appearance of the disease in a sporadic manner —attacking only one horse in one lot, and two or three in another, leaving several lots intact in the same region and living under the same conditions— the malady never appearing in an epizoötic form when different lots in which it is present are collected in the same "curral" at the period of "Services"; the instances in which foals run with their diseased dams and are, nevertheless, unaffected; all these facts negative the notion as to its contagiousness. Yet, on the other hand, its modes of extension and the conveyance of the disorder are still inscrutable, and might point to the presence of a contagious principle. It is admitted that it may be transmissible by way of heredity. The conclusion arrived at is, that the "Mal de Cadeiras" is an enzoötic disease, but that it affects an intensive form, its centres vary and extend, and sometimes several years elapse between its outbreaks. In the enzoötic centres, the malady is chiefly witnessed as an enzoöty, and rarely in an epizoötic form.

With regard to the symptoms, they point to pressure on and irritation of the spinal cord, as well as its nerves. The hind-quarters are rigid and the loins arched; the conjunctivæ are congested and streaked with red bands, particularly about the membrana nictitans; the mouth is dry and the jaws somewhat stiff; and the reflexes in the posterior region of the body are exaggerated. The conductibility of the spinal cord being partially interrupted in consequence of softening and degeneration of its elements, there is a reflex hyper-excitability, betrayed by rapid and exaggerated flexion movements in the hind-quarters, when the dorsal spine is pinched towards the lumbo-sacral region. It is the same with the patellar reflex, when, the limb not being on the ground, the stifle is struck. At this stage the animal is unfit for any service. Sensibility is not seriously modified until a later period. The animal can walk, and in progression there is only observed a

balancement movement. The appetite and more important functions are unimpaired. In the stallion there is disturbance of the generative functions, and impotence is particularly remarked. The circulation is feeble, and in some animals slight anæsthesia is noted in parts of the posterior limbs—or rather a kind of delayed perception of sensation when muscle or tendon is struck or pricked. The animal drags the anterior part of the hoofs on the ground. Towards the end, the sensations appear to become more painful, and the movements more difficult; the patellar reflexes are abolished, decubitus is prolonged until paralysis, emaciation, and marasmus terminate the disease, which may last from a few days to a whole year, or even longer. Rebourgeon had never seen the acute form, though it is known.

After death there is generally no tympany or cadaveric rigidity, but sometimes there is slight infiltration of the subcutaneous connective tissue in dependent parts of the carcase; emaciation is more or less marked, but there are no ecchymotic spots. There is no intra-thoracic effusion, except a little in the pericardium, neither are there adhesions or congestions. Nothing of moment is to be noted in the abdominal cavity. The blood contains more white corpuscles than usual, and the red ones are irregular and crenated in outline; among the corpuscles are a great number of fine pigmented granules. Everywhere the muscles are of their ordinary volume, except in the posterior region of the body, where they are pale and wasted, especially the psoas muscles, which are, besides, infiltrated, and look as if they had undergone maceration. Diminished in volume, the fasciculi have a tendency to separate into fibrillæ, which is very readily done by means of needles. The striæ are yet remarked, and picro-carmine stains the fibrillæ perfectly. There is no fatty degeneration, and the connective tissue is full of pigment granules. The pia-mater is congested, the ventricular fluid increased in quantity, and the grey matter of the brain slightly softened. In one instance a small hæmorrhagic patch was found towards the second internal occipital convolution; the clot was about the size of a grain of maize, and surrounded by an inflamed portion, in which were crystals of hæmatine. The nerve cells have a tendency to decrease in size, and their prolongations are shorter, while there are many pigment granules. The alterations in the spinal cord are more characteristic. At the lumbar enlargement there is considerable hyperæmia of the pia-mater, and the surface of the cord itself is sometimes slate-coloured. On section, the cord is somewhat rose-coloured, owing to a certain amount of vascularisation and dilatation of the blood-vessels; there is also notable softening of the grey substance. Microscopically examined, some cells are found hypertrophied, while others are, on the contrary, atrophied, and beginning to undergo fatty degeneration; all are more or less filled with pigment granules.

The alterations in the nerves are equally characteristic. They appear to be compressed at their aperture of exit, the myeline is more or less destroyed and their substance is softened. These lesions are more particularly remarked in the posterior branches of the lumbar and sacral nerves which pass to the skin, the lateral parts of the loins, and the thighs, as well as the sacro-lumbar muscular masses.

With regard to prophylactic measures, Rebourgeon is of opinion that it is necessary to regenerate the breed of horses by introducing stallions from Europe. The therapeutic measures employed have given excellent results, but they are not described in the paper.

Some pathological pieces sent to Paris were examined by M. Cornil, in the laboratory of the Faculty of Medicine, but the results were negative, so far as the discovery of micro-organisms is concerned.

THE ETIOLOGY OF STRANGLES.

To the *Deutsche Zeitschrift fur Thiermedicin* for 1888 (p. 437), Professors Sand and Jensen, of the Copenhagen Veterinary School, contribute an interesting paper on their experimental researches into the nature and etiology of Strangles. As a result of these, they arrive at the following conclusions:—

1. In the pus and other discharges from horses affected with Strangles, there can be isolated a special streptococcus (*Streptococcus equi*), which is pathogenic for the domestic and field mouse, the rabbit, and the horse.

2. With regard to etiology and clinic, the disease is the same in old as in young horses.

3. It may be evolved without formation of abscess, and manifest itself only by a simple catarrh of the upper air-passages and pharynx.

4. The streptococcus does not appear to be capable of infecting intact mucous membranes; it is probable that a pre-existing catarrh or slight mechanical irritation of mucous membrane is necessary to produce infection.

5. Intravenous introduction of the virus does not seem to produce general infection in the horse, but rather gives rise to an intense phlebitis; yet it nevertheless confers immunity against subsequent infection by the nasal mucous membrane.

6. The *Streptococcus equi* is not at present distinguishable from other micro-organisms of the same class, except by its pathogenic properties, and the appearance of its cultivations on agar-agar. They offer no special features in broth nor yet on gelatine.

APPLIANCES FOR PERCUSSION.

DURING a recent visit to Germany, amongst other interesting details, I was much struck by the extended use of percussion instruments in the clinical study of chest diseases. The appliances consist of a hammer and a pleximeter or shield, as the intermediary body, to receive the blow; the results obtained are said to be far more satisfactory than when the fingers are employed, the

sounds of resonance and dulness being more distinctly appreciated by the ear. They are specially applicable when the coat is long, as in winter and in rough-haired dogs. Messrs. Arnold and Sons have kindly supplied the engraving, and at my suggestion have made adjustable heads for the hammer, the larger for use with horses and cattle, the smaller with dogs, etc.

These instruments should be universally adopted in our veterinary schools, as their use constitutes a neat and handy method for percussion.

E. E. BENNETT,
Army Veterinary Department.

Reviews.

ROARING IN HORSES (LARYNGISMUS PARALYTICUS): ITS HISTORY, NATURE, CAUSES, PREVENTION, AND TREATMENT. By GEORGE FLEMING, C.B., LL.D., F.R.C.V.S., etc., Principal Veterinary Surgeon of the Army. (London: Bailliére, Tindall, and Cox, 1889).

This is a handsomely printed and well got up volume of 160 pages, dedicated to his Grace the Duke of Westminster. It is the outcome, as the author tells us in his preface, of more than five-and-twenty years' study of the subject. In this preface, Dr. Fleming asserts, in effect, that Roaring can be cured by an operation which he has devised; and that, in his belief, the operation has brought to light much useful physiological information with regard to the larynx of the horse. He believes, too, that in connection with the operation he has demonstrated that the method of giving chloroform unmixed with air gives us the safest and best anæsthesia in the horse. This volume is another of the many works that have emanated from the pen of Dr. Fleming; and, like its predecessors, it bears the stamp of long and earnest thought and inquiry, and of intimate acquaintance with the literature of the subject in all languages.

Chapter I. is devoted to the *history of Roaring*, and opens with the very pertinent remark that "next to lameness in horses, defects in respiration are perhaps of the most importance. To be sound in wind and limb comprises, according to the popular notion, nearly all that is required in a horse; for unless capable of moving at a certain, and perhaps rapid pace, and probably exerting a great amount of strength while in motion, this animal would be of little value to man." In reviewing the history, the author has given himself no end of trouble in tracing out and recording the opinions held by the various writers on the subject, not only in this country but upon the Continent, and a glance at a few of these is not without interest.

Gibson, writing in 1725, attributes Roaring to "a thick mucilaginous matter sticking in the branches of the windpipe." Willis, in 1775, states that the wheezing proceeds from "the narrowness of the passages between the bones and gristles of the nose." Lawrence of Birmingham, in 1801 writes: "From my own observation, I have not been able to discover whether its source is the lungs, the trachea, or the nose." White, in his Compendium, published in 1802, says: "It seems to rise from lymph that has been effused in the windpipe or its branches, which, becoming solid, obstructs, in a greater or less degree, the passage of air." Percivall, in his Lectures, published in 1824, writes: "Some years have now elapsed since it was first discovered that the larynges of roarers occasionally presented us with the singular phenomenon of the muscles on one side being wasted away or absorbed, while on the other they appear to exhibit unusual volume and redness and strength of fibre. I have lately examined a horse of Mr. ——'s, and in his larynx upon the near (left) side, the crico-arytenoideus posticus was very pale and shrunk to half its original size; the

crico-arytenoideus lateralis, the thyro-arytenoideus, and the arytenoideus were altogether colourless, and scarcely recognisable as muscles; but their antagonists upon the other side were unusually red and strong. Now these muscles contracting in pairs are all employed in dilating the glottis; but if one set act by themselves, this orifice is not only distorted but actually diminished in dimensions, in consequence of the arytenoid cartilage of the opposite side being drawn over it. Thus it is, then, that Roaring is here produced." French, German, and other writers are referred to, and the whole subject is treated in a most lucid and interesting manner.

Chapter II. is devoted to the various causes of noisy respiration, and these are mentioned and carefully explained. The more important are: out of training, *i.e.*, want of condition; position of head when galloped; pulling at the bridle with open mouth and retracted tongue; paralysis of the wings of one or both nostrils; fleshy or bony tumours in nostrils; pus in the guttural pouches; deformity of the cartilages of the larynx; spasm of the constrictor muscles of the larynx, and in this sentence (page 16, line 12th from the foot) the word "respiration" evidently should be "inspiration"; angina; strangles; enlarged parotids; malformation of the trachea; certain kinds of food, as the lathyrus sativus; and lead-poisoning.

"All these differences, and the causes to which they are due, need close investigation in the majority of instances, for upon the result will depend the probability of remedial measures being successful in restoring the affected animals to efficiency" (not "efficacy," as printed, see page 20, line 15th from the bottom).

Chapter III. treats of the prevalence of Roaring, and it opens with the statement that "Roaring is much more prevalent in western and northern than in eastern and southern countries. In India the indigenous horses are seldom affected, and imported stallions known to be roarers, it is said, rarely beget a roarer."

Inspecting Veterinary Surgeon Meyrick supplies some very valuable information upon this point, and states that he "never met with a case of hereditary Roaring in India, there being no roarers among either the stallions or brood-mares of the studs to which I was attached." In South Africa, native-bred horses are rarely affected with Roaring; but newly-imported horses, especially English, are very liable to the malady. At the Cape of Good Hope, Roaring is almost unknown, and a breeder of horses writes:—"I would not mind breeding from the rankest roarer you could give me. I do not believe that Roaring is transmitted from the parents in this part of the country, and I do not know of a single instance of a roarer having been bred here." He also instances cases of imported roarers becoming sound in their wind. The author then deals with the subject of Roaring in the British Army, and from statistics makes it appear that 6·14 of the horses are roarers. From our experience, we have no hesitation in asserting that the percentage of roarers in the three kingdoms is greater than this.

Chapter IV. is devoted to a consideration of the predisposing causes of chronic Roaring, and the information here again is valuable and inte-

resting. The author says that "these causes are numerous and various, and some of them are more potent and obvious in their influence than others; they may be considered in their relation to (1) climate, (2) heredity, (3) breed, (4) sex, (5) size, (6) age, (7) conformation, (8) management, (9) accidental causes."

1. *Climate.*—"Cold and damp climates appear to favour its production, not only because they are inimical to the natural vigour of horses, but also because the artificial conditions in which these have to be maintained in order to protect them from the deteriorating influences of climate, or to improve them, are predisposing agencies in themselves, tending as they do, and as we shall presently show, to develop those maladies which so frequently lead to Roaring."

2. *Heredity.*—"Of its existence I think there can scarcely remain a doubt. We do not know when Roaring first began to be observed in England, but it would not appear to have been much noticed until within the last century or two. Was the tendency to it imported into this country by foreign horses of large size? Godine, junr., long ago asserted that the defect was introduced into Normandy, in 1764, by Danish stallions which were roarers. May we not have got it among our horses from a similar source, and about the same time?"

The author now refers to the evidence submitted by German, Danish, and French authors to prove the heredity of Roaring, and further asserts that in England the instances that might be quoted in support of hereditary predisposition are very numerous and convincing.

3. *Breed.*—"All breeds are not equally predisposed to become roarers." In France, Reynal asserted that the affection was more frequently observed in heavy draught-horses than in those used for light draught or riding. In Germany, it would appear that the lighter breeds furnish the largest percentage of roarers.

Dr. Fleming's experience has led him to form the opinion that the breed of saddle-horses is more predisposed than any other; but our experience is that the heavy breeds of horses are more frequently affected, and particularly Clydesdale and Shire stallions.

4. *Sex.*—The percentage of cases, according to Dr. Fleming, is nearly equal in the British Army.

5. *Size.*—"Though it is a fact that large horses are more predisposed to become affected than small ones, or ponies, yet size cannot be looked upon as nearly so important a factor as the other influences we have been considering."

6. *Age.*—The evidence adduced under this head goes to prove that Roaring is seldom exhibited until the animal is at least six months old, and that from three years to five years is about the average period when horses become roarers.

7. *Conformation.*—"Certain conformations have been always more or less associated, in the minds of horsemen, with a tendency in horses to become affected with Roaring. In this country horses with long, thin necks—'ewe-necked'—are supposed to be more likely victims than those with better formed and proportioned necks." But Dr. Fleming

attaches no importance to the length or shape of the neck, or certain other forms of conformation.

8. *Management.*—Regarding management, or rather mismanagement, he attributes Roaring in racing stock to be largely due to the training and racing of horses at two years of age, and to the temperature at which the stables are kept, and want of proper ventilation.

9. *Accidental Causes.*—Under accidental causes, reference is made to the frequency with which Strangles precedes Roaring. Among Army horses it has been found to hold the first place on the list of causes "predisposing or exciting to Roaring"; and the same remark, we think, applies to all horses, no matter what may be the character of the work in which they are engaged.

Chapter V. is devoted to a brief consideration of the symptoms and diagnosis of chronic Roaring, and as these are generally well known and understood, comment is unnecessary.

Chapter VI. gives an account of the anatomy and physiology of the larynx. It is illustrated by figures, which have the great merit of being sufficiently large to be understood. The action of the dilator muscles is frequently dwelt upon, and not without good reason. But we can scarcely admit that these muscles are *unceasingly* in action, as the author sometimes seems to imply. During expiration they must have the same rest that is given to the ventricles of the heart in diastole. Nor (as the author says) is there much dilation during quiet inspiration. But, of course, the unaffected dilator will be kept "hard at it" during inspiration in a roarer. It is noted that Möller and others maintain that the motor nerve for the crico-thyroid is the first cervical, not the superior laryngeal. According to Möller, the latter is a trophic nerve for "all the laryngeal muscles."

In Chapter VII. the writer passes on to consider the pathology and course of chronic Roaring. The well-known unilateral atrophy of the muscles is described, and its cause traced to the recurrent nerve. On page 100, by a slip of the pen, the crico-thyroid is said to be "supplied with motor filaments by the *spinal accessory* nerve." This should read, no doubt, *first cervical.* Writing under the heading "Course of Roaring," a physiological explanation is offered of the fact (noted under "Pathology") that the dilator muscle suffers first. If the larynges of man and many animals be excised soon after death, it is found that the dilators lose their excitability before the constrictors.

Chapter VIII. treats of the causes of chronic Roaring. "Mechanical" causes are defined as the impediments to respiration. "Pathological" causes, as the morbid changes, bringing about the impediments. Mechanical causes are taken first. In commencing Roaring, the sound is said to be probably produced by the vocal cord alone; this cord (of the affected side) not being sufficiently drawn aside, is thrown into vibration by the ingoing air. In advanced cases, during exertion, there can be no doubt, it is said, "that the arytenoid cartilage shares with the vocal cord in obstructing the admission of air, and renders the noise louder and of a different tone." Further, in cases of complete wasting of the dilator, the vocal cord and cartilage are described as passing

beyond the centre of the cavity during severe exertion, thus still further diminishing the air-passage. The explanation of this, according to Dr. Fleming, is double. In the first place, the air, in inspiration, inflates the ventricle of the affected side, thus pushing the vocal cord (and attached arytenoid cartilage) towards the opposite side. The author, however, does not record any *actual observations* of this in roarers. In the second place, the inspired air presses down the upper part of the arytenoid cartilage itself. In this case and in others one cannot avoid the conviction that we really know very little about the action of the laryngeal muscles. It is easy to see that a muscle may have a certain action. But how much do we *certainly* know of the behaviour of the muscles in the different conditions of the larynx? Is equine laryngoscopy (for the purposes of research) an absolute impossibility? The pathological causes are next dealt with. These are at once traced to the different *thoracic* relations of the left and right recurrent nerves. The left is exposed to pressure, etc., from morbid conditions. The most frequent condition, in the author's experience, is enlarged and indurated intra-thoracic glands. It is mentioned that Ferguson, in 1838, described a typical case of this kind. Three other examples of pressure are given together—one by engorged pre-pectoral lymphatic glands, one by the left thyroid gland, and one by a bony tumour. In the days of bleeding, it is said, inflammation of the jugular vein was not an infrequent cause. Dr. Fleming holds that the pulsations of the posterior aorta can hardly cause strain and paralysis of the left recurrent nerve. He points out that the anatomical relations are the same in countries where Roaring is unknown. The records of the operation of nerve-stretching in the human subject may bear upon this point. A man may be nearly lifted by his sciatic nerve, and this may be done several times at the operation. Dr. Fleming, however, seems to think that this may be a cause in the case of thoroughbreds, when used for racing purposes at two or three years of age. Or, at least, that in this way a hereditary predisposition may arise. The various inflammatory diseases of the chest—Pleurisy, Bronchitis, Broncho-pneumonia, and others—are mentioned as being not unfrequently causes of Roaring. But Strangles is said to be "perhaps the most frequent cause of Roaring met with among Army horses." In this case "its occurrence in all likelihood depends upon whether the tracheal and bronchial glands—between which and the submaxillary glands there is great sympathy—are inflamed and swollen." On page 122 the word lung is printed for nerve, but the misprint is obvious. That Roaring often followed Strangles was known to Sewell sixty years ago, though in the quotation taken from his writings he does not attribute the affection to interference with the nerve. The author looks upon high temperature as not proved to be a cause of Roaring. He points out that it is often accompanied by circumstances much more likely to be at the bottom of the mischief. This is obvious in the case of Army horses during sea voyages and campaigns.

Chapter IX. contains an exposition on the "preventive and curative treatment of chronic Roaring."

1. Prevention from a sanitary point of view.

"The prevention of chronic Roaring is of the utmost importance, and should be the chief aim of those who have it in their power to carry out the measures essential to this end. They may be enumerated as follows: (*a*) exclusion of unsound horses for breeding purposes; (*b*) care in the management of young horses; (*c*) hygienic management."

2. Medical and surgical treatment of Roaring.

In discussing this department of his subject, Dr. Fleming says: "From Percivall's time up to a quite recent period, little has been done in the way of treatment for the defect, and that little has been, as a rule, of the most empirical kind, *due to the fact that the morbid conditions* upon which Roaring depends *were unknown* or not understood."

"Now that we understand the pathology of Roaring, we are in a better position to adopt rational measures for what we may term its 'cure,' and with much certainty of successful results."

Admitting that from Percivall's day until lately little has been done in the way of treatment for Roaring, we are forced to differ from our author in attributing it "to the fact that the morbid conditions upon which Roaring depends were unknown or not understood." With all deference, we maintain that almost all that is now known and published regarding "the morbid conditions upon which Roaring depends" were known and taught by the late Professors Dick and Barlow when we occupied a student's place on the benches of the Edinburgh Veterinary College in the year 1855. In proof of this contention we transcribe the following from notes in our possession. "Roaring; this certainly in itself is not an inflammatory disease. It is a name given to that state of respiration when we have a coarse roar uttered, particularly in inspiration, etc. I (Professor Barlow) believe this affection can only be produced by, and is entirely dependent on, one pathological condition, viz., atrophy of the muscles of the larynx and wasting of the *nerve* supplying them. Those muscles which are particularly involved are the crico-arytenoidæ, etc., etc. This wasting is due to absorption of the muscular fibres and their transverse striæ, and in place of which there is deposited fat, constituting what is termed fatty degeneration. This change accounts for the pallid appearance of the affected muscles. Now this muscular atrophy has been considered by some as the immediate cause of the disease; my opinion is that, although it is the immediate cause of the sound, it is not of the disease, inasmuch as the wasting is dependent on something else, and that is, *atrophy or injury of the left recurrent nerve.* I should say, then, that the wasting of the muscles is the cause of the sound (roar), but the disease itself is immediately caused by *disease* of the *nerve.*" Professor Barlow then proceeds to explain how the cartilages of the larynx fall in and the dimensions of the glottis are lessened, etc., etc.

We claim, then, that the late Professor Barlow was familiar with the paresis and paralysis of the left recurrent nerve, and of the neuropathic origin of the atrophy of the muscles in chronic Roaring; and the following remark, also made by the author, we consider has no point in his (Prof. Barlow's) case: "This implication of the nerve in the morbid changes

has strangely escaped the investigation of veterinary writers *until lately.* For instance, Williams asserts that 'dissections have failed to discover any change in the nerve-trunk itself, although the animals dissected have been confirmed roarers for years previous to their death. In the form of disease involving the laryngeal muscles which commonly causes Roaring, there is no change in the nerve itself.'"

(*a*) Medical treatment of Roaring. Our author has not much faith in any form of medical treatment, but recommends preparations of iodine, iron, mercury, arsenic, strychnine, and electricity in the form of Faradisation.

(*b*) Surgical treatment of Roaring. Under this section reference is made to the following operations: cauterisation and counter irritation; tracheotomy; removal of one or both vocal cords; operating through the trachea, as performed by Günther, of Hanover, and his son, seton through the laryngeal sac; excision of the arytenoid cartilage; excision of the processus vocalis and vocal cord, etc., etc. The author then proceeds in a clear and interesting manner to describe how he felt his way to the performance of the operation which he now recommends to the profession, viz., excision of the whole of the left arytenoid cartilage and vocal cord, through an opening made in the middle crico-thyroid ligament, the cricoid cartilage, the crico-tracheal ligament, and one or more rings of the trachea.

"This perfected operation," the doctor states, "has had most encouraging results, and so far as these go, it might be anticipated that a very large percentage of horses affected with Roaring may be rendered serviceable, and perform their work without impediment in respiration."

The concluding chapter is devoted to a minute description of the operation as performed by Mr. Raymond, under Dr. Fleming's direction, and the instruments and other appliances required in the performance of the operation.

We have great pleasure in recommending the work to the members of the profession, as its perusal will afford a variety of food for mental thought and study, not only at the moment, but for time to come; and it will enable all who feel so inclined to perform the operation in a scientific manner, and without unnecessary suffering to the animals operated upon.

We understand that upwards of one hundred horses have been operated on and without a single mishap, and we sincerely hope that time will prove that the operation is not only attended with an immediate but also lasting benefit; but whether the benefit be permanent or not, Dr. Fleming has done his best to throw light upon the subject and the operation, and all impartial members of the profession will admit that he has again earned its lasting gratitude.

JAMES MCCALL.

The work before us, though treating of a matter of widespread general interest, is evidently intended for the professional reader. It will not be once doubted that the most considerable inconvenience and pecuniary loss due to Roaring justify the specialising of its study.

The 160 pages which are here devoted to it by one so eminent in his profession, and so well known to the horse-owning public as Dr. Fleming, will be eagerly perused, not only by veterinary surgeons, but by all who are interested in the subject and capable of appreciating it.

The reader will soon be convinced of the great labour which has been bestowed on the production of the book. It will be patent that wherever attainable a wide range of opinion has been brought to bear on every point, and the history and bibliography, though possibly not complete, are remarkable for their fulness.

The space relegated to the anatomy and physiology of the larynx, in which a copious and lucid text is supplemented by several clear diagrams, will afford convenient and useful reference; as apart from an intimate knowledge of the structures and functions involved, the study may not be approached with any reasonable hope of practical good.

Taking into consideration the varied and indefinite ideas which have existed as to the pathology of the condition in question, it will not be a matter of surprise if some views expressed do not coincide with those generally received. There will, however, be little disagreement as to the main points, *i.e.*, that the left recurrent nerve in some part of its course becomes so affected that paralysis of the muscles of the larynx supplied by it is the consequence, and that, resulting from this, there is an alteration in the glottal opening, which causes the abnormal sound and accompanying dyspnœa.

The causes likely to predispose to or excite this condition of nerve are extensively dealt with, and though it cannot be said that these may not be further elucidated, yet sufficient is made clear to allow of rational suggestions as to their prevention. It cannot, I think, be disputed that in a large majority of cases of chronic Roaring the structures are affected in a manner practically that laid down by Dr. Fleming.

Approaching the treatment of the affection, the writer refers to "two cases which perfectly recovered" after electricity—a form of Faradisation—in conjunction with internal remedies, and, I think happily, he does not suggest this procedure, except as a possible or tentative means in the earliest stages, when, with the aid of deobstruents and time the pressure on the left recurrent nerve is likely to be removed. We can understand that electricity, if applied frequently, may possibly maintain to some extent the vitality or irritability of the muscles which are cut off from their nerve nucleus. Unless the proper relation of the nerve endings in the muscles with their nuclei be established, I fail to see how electricity can be of any value.

For the Roaring and dyspnœa, our main concern in this trouble depending on narrowing of the glottal opening and alteration of contiguous structures, it would appear that the desideratum is the permanent expansion to the normal during the respiratory act. Dr. Fleming clearly points out that this has been recognised by him, and states that fifty-six years ago Günther proved that inter-tracheal and inter-laryngeal operations were largely tolerated. The last chapter, in which the writer discusses the mode of surgical interference which he adopts, will be regarded with the utmost interest. Here will be found a most explicit

text, illustrated by diagrams referring to sections and instruments. The operation described has been very largely carried out, and no remarkable accident has been recorded.

Some matters of detail with which our experience may not be in accord involve perhaps but difference of opinion. For instance, in my general examinations I find cart and heavy horses more commonly affected with Roaring than the lighter classes. It is certainly a remarkable statement, that among 3,000 tram-horses, there should be no case of a Roarer. My experience, and that of many continental veterinary surgeons, has been that about the same amount of chloroform is sufficient. The disparity in the proportions of ingredients with which it is advised to sponge the wounded larynx, as well as some printer's errors, are sufficiently palpable to indicate their source.

Among the most important statements in the work is that "this perfected operation has had most encouraging results, and as far as these go it might be anticipated that a very large percentage of horses affected with Roaring may be rendered serviceable, and perform their work without impediment in respiration." This from one holding the prominent position of the distinguished author, will be sufficient to commend the work to the consideration of the profession and public; and it cannot be doubted that its publication will mark an era in veterinary laryngeal surgery in Great Britain.

JOHN PENBERTHY.

TRATTATO DI TECNICA E TERAPEUTICA CHIRURGICA GENERALE E SPECIALE DEGLI ANIMALI DOMESTICI. By Dr. LANZILLOTTI BUONSANTI. (Milan: Fratelli Dumolard. 1889.)

The very distinguished and indefatigable director of the Milan Veterinary School, and who is also professor of operative and clinical surgery therein, has published the first volume of a work on Veterinary Surgery, which promises to be of great value to Italian practitioners and students. This volume treats only of the *technique* and therapeutics of general surgery, but it nevertheless contains nearly 600 pages and 440 illustrations. It is divided into two books, and each of these, again, into sections and chapters, in which the different parts of the subject are treated with great care and in ample detail, the bibliographical portion being very complete and of special value. When the work is finished we shall give it a fuller notice, as we shall then be in a better position to form an opinion of its merits

THE BEST FORAGE PLANTS. By Drs. STEBLER and SCHRÖTER and N. MCALPINE, B.Sc. (London: D. Nutt. 1889.)

This is the translation of a work which is eminently deserving of notice by botanists, agriculturalists, and veterinary surgeons who concern themselves with forage and feeding of horses. It appears that in 1882, at the request of the Swiss Agricultural Society, the Federal Assembly voted a large sum of money to encourage the cultivation of forage, and it was decided that a portion of this grant should be devoted to the production of a popular manual on the subject of forage plants.

The task was entrusted to Dr. Stebler, well known as a seed analyst and practical agriculturist, while the preparation of the plates and woodcuts was undertaken by Dr. Schröter, professor of botany at Zurich. "The result of this happy combination," says the translator, "is the masterpiece now for the first time presented in English, and destined, or I am greatly mistaken, to operate a revolution in the forage culture of Great Britain." There is no work like this in our language on the subject of grasses; the detailed or special description of each plant is perfect, and so clear that any one could comprehend it, while the part of the book dealing with the subject in a general manner is full of interest and importance. The plates are in every way commendable, and appear to be as carefully drawn as could possibly be expected. For those who desire to know all about forage plants, no better instructor can be found than the work which Professor McAlpine has introduced to English readers in a translated form which leaves nothing to be desired on the score of clearness and accuracy.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COUNTIES' VETERINARY MEDICAL ASSOCIATION.

THE general annual meeting and dinner of this Association took place on February 22nd, at the Great Western Hotel, Reading. Mr. G. A. Drewe (Abingdon) President, occupied the chair, and Mr. Albert Wheatley (Reading), the vice-chair. There were also present:—Sir Henry Simpson, Messrs. F. W. Wragg, J. D. Barford (Southampton), Wm. Wilson, Jas. F. Simpson, J. P. S. Walker (Oxford), Treasurer, C. Carter (Guildford), Hy. G. Lepper (Aylesbury), E. J. Mellett (Henley-on-Thames), A. Everard Barlow (Reading), J. Varney (Winslow), Wm. T. Hatton, S. J. Blanchard, Sydney H. Slocock, and A. A. Jones (London), and H. Kidd (Hungerford).

The HON. SECRETARY said he had received letters apologising for inability to attend from several gentlemen. They all regretted the absence that day through illness of their host, Mr. W. G. Flanagan.

Mr. J. H. Wilson, M.R.C.V.S., Newbury, Berks, was proposed as a member of that Association. Carried unanimously.

Considerable discussion followed as to the approaching election of members of Council. Ultimately the meeting decided not to bind the members in any way by a formal resolution. The name of Mr. Mulvey was mentioned during the debate, and met with the hearty approval of those present.

The PRESIDENT (Mr. G. A. Drewe) then delivered his inaugural address, as follows:—

As I was not present when you did me the honour to elect me your president for the year, allow me to take the opportunity of thanking you on this occasion.

It is not my intention to detain you long this afternoon, but I think a few words on our position as veterinary surgeons may not be out of place.

It is now nearly forty years since I entered the profession as a pupil, and the rapid strides it has made and the great changes that have taken place in it during that period have been of a somewhat extraordinary character, and, I venture to prophesy, are only characteristic of others to come still more important and progressive.

Chemistry, botany, the knowledge of anatomy, the study of parasitic

diseases, have all contributed to its advancement. To the microscope and the patient investigation of those whose province it is to make the use of it their specialty, we are indebted for the knowledge of those interesting changes which take place on the introduction of certain germs into the blood producing specific diseases, thus rendering their diagnosis clear and definite.

In therapeutics great changes have taken place, and the drastic and heroic form of prescribing has given way to a more soothing and palliative mode of treatment which is very beneficial to our patients. Within my experience, to bleed and administer a purgative was the starting point with some practitioners in treating a great many ailments to which animals are subject. Horses were brought periodically to be bled, the lampas were lanced and in some instances seared, and I remember in one situation I fulfilled being ridiculed because I refused to pour boiling oil and resin into a sinus in a case of poll evil. Those days are happily gone by, and the proceedings in connection with them relegated to oblivion. The introduction of subcutaneous injections, suppositories, etc., have simplified the administration of drugs, and are in some cases indispensable, especially where the patient shows an amount of resistance to the ordinary methods, causing the very act of administration to do more harm than the medicine would be likely to do good.

In operative surgery great advances have been made, and of the more recent are the various experiments for the relief of Roaring. Great credit is due to the gentlemen who have carried on these operations, but I cannot help placing on record a mild protest against the way in which the operations have been advertised to the public, when a great many of the profession were in ignorance on the subject, and before its practical value had been fairly tested. I trust that success may attend the operation, and that it may prove beneficial to the dumb creation.

The Contagious Diseases (Animals) Act has been beneficial in checking the spread of contagious diseases. In connection with this Act, I am of opinion that more liberty should be given to veterinary surgeons as inspectors, that they may be able to place any animal, or animals suspected of being in the incubative stage of disease in a state of quarantine to ascertain if the disease develops itself, or in the event of exposure in a market, or fair, to detain the suspects for a certain time with the same objects.

Whilst congratulating the profession at large on the advances which have taken place, not only in the development of our art, but also in our social position, I cannot help thinking a great deal is due to associations of a kindred nature to the one whose anniversary we are commemorating to-day, and I trust that under the skilful management of our Secretary this society may still continue to prosper. I have noticed from time to time a good deal has been said and written respecting the etiquette of the profession, and I hope this is a matter which will be taken to heart by all its members. The struggle to outdo one another in working at reduced fees, and in other ways overreaching our professional brethren, cannot but be detrimental to our interests, and injurious to the dignity of our calling. Let us trust that as time rolls on and our profession continues to advance we may be brought closer together and depend more and more on our motto, "Vis unita fortior."

Mr. BARFORD referred at some length to the Grand Show of the Shire Horse Society at the Agricultural Hall. They all, he said, took great interest in the breeding and improvement of horses. They were much mixed up with the agricultural interest; and if carried out with judgment nothing would pay the farmer much better than the breeding of shire horses; for never was the demand for exportation anything like so great as at the present moment. (Hear, hear.) He gave notice that at the next meeting he should propose that that Association subscribe to the funds of the Society.

Sir H. SIMPSON called attention to a clay model, in the room, of a bust

of the late Prof. Robertson. After that gentleman's death, he said, Mr. Jones (now present) was asked by the students at the Veterinary College to approach Mr. Birch, A.R.A., with a view to getting a bust to place in the Board Room of the College. A cast was taken of the features of their departed friend as he lay dead; and the result they saw before them. The students had made one or two appeals for funds. Many veterinary surgeons felt that another bust should be obtained, to place in the Council Room of the Royal College of Veterinary Surgeons. That meant money; but two would not cost twice as much as one. He (Sir Henry) brought the matter before the Council of the College. He did not know that he could make any definite proposition, but he brought the matter to their notice, as Prof. Robertson was a gentleman whose memory deserved to be retained in the profession by some such memorial. (Hear, hear.)

Mr. WALKER said he, like a good many other old practitioners, was rather misled by the circular inviting subscriptions issued by the students, and he refrained from subscribing on the ground that he did not care to join the students. He thought they ought to subscribe without associating themselves with the students; and he had no doubt if that opportunity were offered to the profession plenty of subscriptions would come in. (Hear, hear.)

Mr. JONES said the students were unanimous in their desire to get it up and to keep it to themselves. Instead of going to the Council and asking for help, they appealed to the profession individually, which he thought was quite wrong. (Hear, hear.) As they were young men he hoped they would be excused.

Mr. WALKER was quite prepared to subscribe personally, but not as a Society. He thought there was quite enough *esprit de corps* to carry it out if properly put before the profession, without touching the funds of any Association.

Mr. J. F. SIMPSON thought they should allow the President of the College to start a subscription list. Whatever the Association might do as a body, of course he should himself subscribe personally. (Hear, hear.)

Mr. BARFORD, in proposing a vote of thanks to the President, said he thought they had made an excellent selection, Mr. Drewe being a gentleman of good standing in the profession, much respected, and in every way qualified. (Hear, hear.)

Mr. WRAGG seconded with a great deal of pleasure.

The vote was carried by acclamation, and briefly acknowledged.

THE DINNER.

After the meeting the members above named, joined by Messrs. Giles Ayres, Perch, and other visitors, dined together at the Hotel. A capital repast was provided. The President was in the chair, and Mr. Wheatley in the vice.

The CHAIRMAN suitably submitted the loyal and patriotic toasts.

Mr. JONES responded for the Army, and Messrs. Lepper and Ayres for the reserve forces. Mr. Lepper remarking that the yeomanry afforded excellent training for young men and young horses.

Sir H. SIMPSON proposed the toast of the evening, "Success to the Royal Counties' Veterinary Medical Association." At first he feared the success of the Association, but he was very glad to find he was entirely mistaken; because, although they had only been about five years in existence, they already numbered 55 members—all good, substantial men; and all the meetings had been eminently successful. (Hear, hear.) They had had most excellent presidents; but they also owed a great deal of their success to having had such valuable "permanent officials" in their excellent secretary and treasurer. (Applause.) By confining themselves to scientific discussion

and good fellowship, and eschewing anything that might lead them astray from the one object or the other, they would be doing their duty to themselves and to the profession. (Applause.)

The VICE-CHAIRMAN responded to the toast.

The HON. SECRETARY then gave "Kindred Associations." He said not many years ago there were only four or five such Associations in existence, but now they numbered fifteen, besides the National, and another had been either resuscitated or originated in Ireland. Mr. Kidd coupled with the toast the name of a gentleman who had been frequently "chaffed" about being a member of nearly all these Societies—Mr. Wragg. (Applause.)

Mr. WRAGG returned thanks in a neat speech.

Mr. JAS. SIMPSON proposed "Success to the Veterinary Profession." The Veterinary Surgeons' Act is, they would all agree, a good one, and had been of immense service. There were some 903 names on the original "No. 3" register; but as only forty-five deaths had been reported to the Secretary during the last eight years, the Council had thought fit to institute an inquiry, the result being that some 113 names had been removed from the register. He coupled with the toast the name of Mr. Barford. He was a consistent man in every way, he approached a discussion free from prejudice or bias, and he was almost invariably in the right. (Applause.)

Mr. BARFORD replied with particular pride and satisfaction. Referring to the great progress of the profession during the past forty or fifty years, he said there was no doubt the cattle plague visitation of 1865 was the beginning of a new era in the profession. Not only were their services now sought and appreciated in sickness and accident, but he was happy to say principles of hygiene were much more considered, and their opinions asked as to the management of animals while in health. (Hear, hear.) Again, the status of the army veterinary surgeon is now much more satisfactory than it was twenty-five years ago, a great deal of that being due to Dr. Fleming. (Hear, hear.) The Prince of Wales was a very warm supporter of the profession, and the distinctions received by Professor Brown, Dr. Fleming, and a few others at the hands of the authorities showed that talent was appreciated. (Applause.)

Mr. MELLETT gave "The Visitors," and Mr. Giles Ayres and Mr. Perch responded.

Mr. WRAGG submitted "The Health of the President" in eulogistic terms.

Mr. DREWE, in response, said it was close upon thirty-one years since he graduated at the Veterinary College. The profession had made steady and good advance, and he was sure it would continue to do so, both in the estimation of the public and on a scientific basis. (Hear, hear.) He had reserved to himself the pleasure of proposing the next toast, "The Officers of this Association," purposely to express his thanks and gratitude to both those gentlemen for the way in which they had always supported the Society. (Applause.) He hoped they would long continue to be connected with the Association. (Applause.)

Mr. KIDD and Mr. WALKER acknowledged the toast in appropriate terms.

The company then, on the proposition of the President, drank a speedy recovery and long life to the worthy host, Mr. W. G. Flanagan.

During the evening some capital songs were rendered by the President, Messrs. Giles, Ayres, Lepper, Perch, etc. H. KIDD, *Hon. Sec.*

EASTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE members of the Eastern Counties Veterinary Association held their half-yearly meeting at Norwich, on February 12th, 1889. In response to an invitation to all veterinary surgeons in Norfolk, Suffolk, and Cambridgeshire, by the president, John Hammond, Esq., of Bale, a large number met to luncheon,

at the Bell Hotel, prior to the business meeting. At its conclusion the high appreciation of Mr. Hammond's worth as a president was emphatically shown by the most hearty manner in which all present responded to the toast, "The Health of the President," proposed in very appropriate terms by Mr. Shipley. Mr. Hammond having replied, an adjournment for a few minutes followed.

Having reassembled, the minutes of the last meeting were read.

The PRESIDENT then proposed, and Mr. LOW seconded, that any discussion about to follow on these minutes be limited to forty-five minutes, in consequence of a great deal of important business having to be got through.

Mr. JAMES SIMPSON then commenced a reply to the charges brought against him at the Cambridge meeting by Mr. Banham, viz., want of fidelity to the contract entered into two and a half years previously at Cambridge, as to election of members of Council.

So elaborately and exhaustively did Mr. Simpson conduct the defence of his actions that just forty minutes were occupied doing it. Every charge recorded in the minutes was taken separately, and every denial supported, as he told the members, by documentary evidence, which evidence all were invited to inspect under his immediate supervision.

On Mr. Simpson resuming his seat Mr. LOW proposed, and Mr. JAMES GOOCH seconded, "That the members of this Society are satisfied with the explanation given by Mr. James Simpson as to the charges made against him at the Cambridge meeting." The motion was carried, and thus terminated this very important question.

The SECRETARY next read a letter from Sir Henry Simpson denying *in toto* that he had ever, at the Royal Counties meeting or elsewhere, said one word prejudicial to the election of the candidate of the E.C.V.M.A. for the Council.

Mr. OVERED remarked that after accepting Mr. James Simpson's explanation as satisfactory, we ought also to accept that of Sir Henry. He therefore proposed that "Sir H. Simpson's explanation is satisfactory."

Mr. S. SMITH seconded this, and the motion was carried.

The election of officers for ensuing year was next proceeded with.

Mr. J. E. Kitchin, of Norwich, was unanimously chosen President.

Messrs. William Bower, F. Low, and F. E. Auger, Vice-Presidents.

Mr. R. S. Barcham was re-elected Secretary.

The next meeting was arranged to take place at Cambridge.

Mr. F. LOW exhibited an extremely interesting pathological specimen, "The sloughed portion of bowel, in a case of intussusception," the animal still living.

The PRESIDENT next called upon Mr. William Hunting to read his paper entitled

PULMONARY INFLAMMATION IN HORSES.

I hope the title of this paper has not suggested that I am about to produce an exhaustive and systematic essay. I think perhaps Clinical Notes on Pneumonia would have been a better title. At any rate I only intend to refer to some points which are not definitely accepted, and to one or two about which I find myself not in agreement with authorities.

Under the term Pulmonary Inflammation may be included the three diseases usually described as Bronchitis, Pneumonia, and Pleurisy. These three names are convenient, but are seldom quite applicable to any disease seen in the horse. I certainly never saw a fatal case of Bronchitis, but I have seen very many of *Pneumonia* in which the bronchial symptoms during life were rather extra prominently marked. Bronchitis in the horse, as a disease due to the extension of inflammation from the head or throat, I do not recognise. I have only seen it in cases which I should describe as congestion or inflammation of lungs with more than usual mucous *râle*. Practically pulmonary disease in horses consists of Pneumonia or Pleurisy.

The latter generally give rise to some superficial inflammation of the structure of the lung, but to such a slight extent that we may almost say Pleuro-pneumonia is an uncommon disease in horses. We certainly have frequent fatal cases of Pneumonia without a trace of Pleurisy, and we have fatal Pleurisy with so little lung change that we can find no portion of the organ which shows more than slight congestion.

Pneumonia and Pleurisy in the horse are two distinct and separate diseases, frequently occurring without being complicated one by the other.

What causes operate to produce one or the other? Is the differentiating cause to be sought in the horse, or in the outside circumstances?

The older books on veterinary medicine seem to suggest that Pneumonia was the more common fifty years ago, whilst my own experience is that Pleurisy prevailed twenty-five years ago much more frequently than Pneumonia, whereas lately I have seen a great preponderance in the number of cases of Pneumonia over Pleurisy.

Of course this experience on my part may be only due to the circumstances of the practice I saw then and see now. In the olden days we read that ventilation was badly arranged and that stables were kept close and hot.

Such a condition would seem especially favourable to the production of Pneumonia, but I cannot reconcile this with the fact that from a stable perhaps the coolest and best-ventilated I have ever known I lately saw a very large number of cases of Pneumonia.

I don't mean to say that a hot, close stable is not more likely to cause Pneumonia than a cool, well-ventilated one. Probably if the stable I refer to had been hot and close our death-rate would have been doubled. What I do *not* understand is why our cases were not chiefly Pleurisy.

That *cold* is a potent factor in the production of both Pleurisy and Pneumonia I have no doubt. I do not mean by "cold" a prolonged period of constant low temperature, but a period of sudden and violent alternations of temperature. Horses and other animals graze in fields all the winter, and seldom suffer from pulmonary inflammations. It is not in the *depth* of winter these diseases are most prevalent, but in November and March, when the thermometer may vary twenty degrees in the course of twelve hours.

The effects of changes of temperature in the production of pulmonary inflammations are well indicated by the fact that no such disease is seen in horses when these changes are absent. In coal-mines the temperature of the air does not vary ten degrees all the year round—not from the hottest day in summer to the coldest in winter—and no respiratory disease exists there.

This fact seems to me to bear strongly upon the theory we have recently had stated, that Pneumonia may arise as the result of contagion. I know no clinical facts which point to Pneumonia in the horse being contagious. If it were, we should expect to find it arise irrespective of cold, and in some cases to detect some direct connection between an outbreak and a previous case. I think we never see a case in which "cold"—*i.e.*, exposure to an atmosphere very much lower than that to which the horse has recently been accustomed—is not distinctly traceable as a factor in its production.

I may be reminded that horses die from being over-riden in the hunting field; that they die in harness in the hottest days of summer; that they die at work in some excessively hot mines; and that in each case the prominent *post-mortem* lesion is engorgement of the lungs with blood. These cases I do not call Pneumonia; they are simple engorgement, and more correctly designated Pulmonary Apoplexy. In all such cases there is great exhaustion, and death occurs more rapidly than in the cases of inflammation. The lung tissue is obstructed, not by the products of inflammation, but mechanically by the over-distension of blood-vessels. I think in most cases of pure Pneumonia we find the same condition of exhaustion present in some degree.

It is possible to kill a horse by over-work, by cruel and brutal over-riding or driving, no matter how good his condition, but the fatal result is easily reached with a horse out of condition by even ordinary hard work.

Exhaustion and cold combined are the great causes of inflammation of the lungs.

In omnibus and tramway stables there is a considerable mortality from pulmonary inflammation. For every old, seasoned horse that falls a victim we find fifty new, young ones. The young ones are often fat—*always out of condition.* It requires three months' steady work to get a young, sound, strong horse into condition for omnibus work, and it is during this initiatory three months that death from chest affections is most common. Want of condition, *plus* fast work, causes exhaustion, and then we only want cold, changeable weather to produce inflammation of the lungs.

I do not call exhaustion a predisposing cause; it is a direct exciting cause of Pneumonia. In many cases we find young, strong horses affected by the same conditions of work and surroundings that produce no effect upon older horses with little more than half their physical strength. The exhaustion is not the same in each case; the old horse may be muscularly exhausted (tired in his limbs), but his vital organs still possess sufficient tone to react as soon as his work ceases. The younger horse seems to fail in recuperative power, and especially is this marked in the lung tissue.

The fast work done by horses increases the respiratory movements, and therefore the flow of blood into and through the lungs. This natural engorgement of the pulmonary vessels in a horse in hard condition subsides if no external circumstances, such as close, badly ventilated stables or exposure to cold which chills the superficies of the body, are allowed to prevent it. The exhaustion which I wish to claim as a direct exciting cause of Pneumonia seems to depend upon a want of tone in the blood-vessels of the lungs, which are unable to react and control the state of distension caused by fast work.

I rather incline to think that the difference in cause which determines an attack of Pleurisy from one of Pneumonia lies in the state of the blood-vessels of the lungs. Cold will cause *Pleurisy* in a horse without any further etiological conditions; but cold causes *Pneumonia* when the blood-vessels of the lung are wanting in tone, or when they are partially engorged from the increased respiratory action of fast work.

A clipped horse I should expect to be more liable to Pleurisy, and a long-coated one to Pneumonia. Horses, in cold and variable weather, idling about, waiting at shops and houses, alternately with short, sharp runs, would be more predisposed to Pleurisy; so also would horses doing slow work; whereas those doing fast, continuous work would more likely be attacked with Pneumonia.

Symptoms and Diagnosis.—In clear, uncomplicated cases we have no difficulty in diagnosing Pleurisy and Pneumonia in the horse, especially if we see them from the commencement. I must confess, however, that on one or two occasions I have found, on a *post-mortem* examination, effusion in the chest when I only expected Pneumonia, and nothing but Pneumonia when I quite expected Hydro-thorax.

My skill in auscultation is very slight, and I do not trust much in it now. I cannot always detect a splashing sound when I know there is effusion into the chest, and the utter absence of respiratory sound below a certain line may exist with consolidation of the lung, as it does with effusion.

In the early stages of Pleurisy the pain evidenced by pressure in the intercostal spaces is most marked, but such evidence is very much discounted when both sides have been blistered. The line of the abdomen, so often noticeable in Pleurisy, I have seen in Pneumonia, and the peculiar lift in the abdominal muscles almost diagnostic of water in the chest I have often seen in the last stages of pure Pneumonia.

The character of the pulse in the early stages of both diseases is of great help, being hard and wiry in Pleurisy, but full and compressible in Pneumonia. In the latter stages of both diseases it, however, becomes very similar—merely small and weak. I think intermission is most common in Pneumonia.

The cough is very diagnostic of the two diseases, being seldom present in Pleurisy, and always of a short, painful, catchy character; whereas it often exists in Pneumonia, and is not so short and painful.

The pain evinced on movement differs in the two diseases, being very marked in the early stages of Pleurisy, and accompanied by grunting; whereas thoracic pain and grunting in Pneumonia are most marked in the latter stages.

On making *post-mortem* examinations of horses which have died of Pneumonia it is remarkable what differences we find in both the quantity and quality of lung changes that have taken place. Sometimes we wonder what caused death, and in others how the horse managed to live so long.

Very seldom have I found only one lung badly affected in an uncomplicated case. Generally both are engorged with blood. Very seldom do we find in the horse the same extensive consolidation of lung as is seen in cattle which have suffered from Pleuro-pneumonia. In no case where I had reason to believe that the attack was a primary one, have I found grey consolidation and only in those of some duration have I found the more common red consolidation.

In cases of abscess or purulent infiltration of lung I have always found either red consolidation or grey. I do not go so far as to deny that a first attack of Pneumonia may be of such intensity or so prolonged as to lead to abscess or purulent infiltration, but I confess I have not seen a case in which I was satisfied that such a result was solely due to a primary attack.

My experience leads me to think that in every case in which stinking breath occurs during life—a symptom I consider proof of purulent disease—there has been a previous attack which has left some consolidation.

This one point is my chief reason for introducing the subject to your notice. I shall offer my reasons for it, but as my practice is entirely amongst horses of five years old or over, and in town stables, the experience of your practitioners, in healthier conditions and amongst younger animals, may perhaps correct my opinion.

It has been my experience to meet with a number of cases, occurring within a few days of purchase, in which Pneumonia has on the second or third day been accompanied by stinking breath. In two days more death has taken place. In two or three cases the breath was fœtid in twenty-four hours after the first sign of lung disease, and death ensued in twenty-four more hours.

In all these cases a *post-mortem* showed either abscesses or purulent infiltration, but never without well-marked portions of grey hepatisation. In some I found a large mass of red consolidation, with only small patches of grey. In most the patches of grey were not accompanied by any firm red consolidations.

Amongst the horses of a stud which I knew well, and had known for years, we had at times cases of Pneumonia in which death was preceded by stinking breath; in every one of these I was able, by referring to their number and looking back in our register of diseases, to find a previous attack of pulmonary inflammation registered against that horse. In all these I found after death portions of grey consolidation, and I conclude that this condition is a necessary antecedent lesion to purulent disease of lungs.

These facts I would explain by saying that in the most intense cases of pulmonary inflammation death takes place from exhaustion and suffocation long anterior to the time necessary to effect the changes giving rise to grey hepatisation.

In prolonged cases where the inflammation is not sufficiently violent to

destroy life by the obstruction offered to respiration grey hepatisation may occur, but if the horse be properly taken care of the process does not kill, and does not cause the formation of pus either in abscesses or diffused amongst the lung tissue. Of course a relapse at this time may give rise to purulent disease and the accompanying stinking breath, but such an event is just what I say does occur.

Grey hepatisation I take to be a stage in the process of inflammation in which consolidated tissue loses its colour, and undergoes degenerative changes, rendering them capable of gradual absorption, or sometimes of further hardening. In any case such material is largely made up of broken down and degenerated tissues, which are poisonous and capable of giving rise to purulent disease should they in any way obtain access to the surrounding tissues.

A lung containing such material, if it be the seat of an inflammatory attack, fails to retain the degenerated matter in isolation; the grey matter escapes into the surrounding inflamed tissues, and septic infection is the result.

We see a similar state of affairs in lungs suffering from other diseases, in which morbid changes have resulted in masses of degenerated tissue being formed.

In Glanders and in Tuberculosis we may have large masses of the lung tissue broken down, but retained by the surrounding walls of hardened structure. These exist for very long periods of time without producing septic effects; but if the organs affected are invaded by acute inflammation stinking breath soon gives evidence of septic complication, and death is the usual early result.

I believe that stinking breath and purulent disease accompanying Pneumonia are always evidence of the prior existence of degenerated portions of lung, usually from a previous attack of Pneumonia in the horse, but it may be from such deposits as are caused by Glanders or Tuberculosis.

Upon the correctness of my observation depends an important medico-legal question.

I should not hesitate to say that a newly purchased horse which developed a stinking breath as the result of Pneumonia was unsound when purchased. I do not believe that grey hepatisation can take place under at least one month, and if the horse looked well and active I should say at least three more months had elapsed since the primary attack had passed off.

Every case of stinking breath does not die, but not one in a hundred are any more good for fast work. I believe even a mild attack of Pneumonia leaves some consolidation, and this is never cleared up in less than six months. Recovery is far more rapid when a run at grass can be obtained than when only a town stable is available for the convalescent animal. There are just one or two more conditions in connection with pulmonary inflammation I should like to mention, so as to "draw" the members present, and thus test my observation by comparison with theirs.

In cases of bad sore throat the danger of giving drinks is evidenced every now and then by a more or less sudden death—death in say three or four hours. Such cases present on a *post-mortem* examination frothy mucus in the trachea and bronchii, and complete black engorgement of the two small anterior lower lobes of the lung. What is the cause of death in these cases? Not the amount of lung rendered inactive, because we have evidence in other cases that life has been prolonged when a much greater extent of lung tissue has been quite useless. I suppose the frothy mucus must be a great obstruction, and I also fancy there must be some spasmodic action of the lungs which obstructs respiration, aided probably by similar spasmodic action of the glottis.

Acute septicæmia is a condition I have twice seen as the result of an attack

of Pneumonia affecting lungs previously diseased by grey deposit in their substance. The noticeable symptoms were shivering, pain, intense fever, and violent purging, followed by death in from twenty-four to forty-eight hours.

Cerebral symptoms I have twice seen accompany Pneumonia, or rather perhaps I should say Pulmonary Apoplexy, for the cases both died within two hours of reaching the stable. No *post-mortem* of the brain was made, which I regret exceedingly, as I cannot even guess whether there was previous brain disease, or whether the violent convulsive symptoms were directly due to the pulmonary condition. In neither case did I observe any old standing disease of the lungs—nothing but intense engorgement.

Treatment.—Every horse that is found "blowing" is not, I think, the subject of inflammation of lungs, but if he be permitted to remain in a hot stable, and the "blowing" continue, he most certainly will be.

The inflammatory process tends to the same course in the lungs as in every other tissue, and treatment must be directed to the stage we have before us.

First, active congestion, during which the blood is increased in quantity and in flow.

Next, passive congestion, in which there is increased quantity with decreased flow.

And then inflammation, in which increased quantity of blood is accompanied by decreased flow and more or less stagnation, with exudation through the vessels.

In "blowing" we have active congestion, and we have every right to hope that proper treatment in this stage may lead to subsidence, and a speedy return of the circulatory balance with very little local injury.

In this stage the first necessity is pure air and plenty of it, diffusible stimulants, and clothing to the skin. Recovery should be evident in an hour or two, or we may fear the next stage of passive congestion. Should the extremities not regain their normal temperature, should the pulse remain high and the respiratory movements continue rapid, I repeat the diffusible stimulants and apply external stimulants to the chest. I never hesitate to use external stimulants if a case of "blowing" continue over two hours after the administration of active diffusible stimulants, nor would I wait so long if great coldness of extremities accompanied it.

How do external stimulants act? Not locally, I think. I do not believe applications to the skin of the chest have a direct action on the lungs; they act on the nervous system, and would probably produce as good an effect if put on the back or the belly. I never use cantharides blisters, only mustard or turpentine liniments. When Pneumonia is established I prefer hot rugs to the chest, and do not continue the diffusible stimulants to any great extent. I have a horror of continually drenching a horse with alcohol in diseases which I know will extend over many days and be accompanied by great loss of appetite. I think such treatment injures the stomach and destroys the appetite, whilst it interferes with digestion. The most important detail is fresh air and plenty of it. I tie the horse's head to the open door, and keep him there for days, protecting the body by warm clothing. In medicine I trust little, but devote attention to changes of food to induce the animal to eat. When food is obstinately refused I give oatmeal gruel, milk, beef-tea, and grass when I can get it. Frequent administration of medicines entailing raising the head is much to be deprecated, as it causes the horse pain and worry, and increases his respirations for a long time afterwards. When debility is great I think I have seen good results from nux vomic and zingiberis given in a ball. I never give physic or sedatives. Aconite and belladonna I have not employed in Pneumonia for twenty years, nor do I believe in the

use of potass and ammonia given with a view to some supposed action on the blood. Diuretics I employ throughout the case, and stimulants sparingly. I have noticed that dry frosty weather favours recovery, but that the continuance of a thick London fog for a few hours retards every case, and frequently kills the bad ones.

The CHAIRMAN, after remarking on the excellency of the essay, said he did not wish to call on any particular member to reply, but he hoped they would all join in the discussion.

Mr. SANTY said his experience was very limited as to Pleurisy and Congestion of Lungs, but he had seen a very great deal of what he called "Epizoötic Catarrhal Fever." This affection would—despite what treatment you adopted—run its course for about nine days, when you would get a very rapid recovery, or else the animal would become worse, showing signs of either blowing or biliousness. In the blowing cases he applied a blister to chest at once, gave plenty of nutriment—eggs especially, if he could get them—and not much medicine; he considered that hot rugs, if judiciously applied, were often beneficial.

Mr. WM. BOWER wished to ask the essayist whether, in the event of lungs being left more or less hepatised from an attack of Pneumonia, the second attack is produced from cold or over-work.

In reply, Mr. HUNTING said he had never seen it produced by cold without work.

Mr. JAS. SIMPSON believed in hot rugs in the early stages both of Pleurisy and Pneumonia. Stimulants he had found of much service, especially carb. of ammonia combined with ext. gentian. He always gave it, whether pulse was high or low. His experience was that Pleurisy was quite as frequent now as formerly.

Mr. SHIPLEY thought that in the early stages there was nothing to equal hot rugs for inflammatory diseases of the chest, provided you could get them properly applied; if not properly applied he considered them injurious; in consequence of the great difficulty, almost impossibility, in getting proper attention to hot rugs in country places, he had quite gone back to the treatment of sixty years ago, viz., cantharides blister to sides, and he had never seen any bad results from it. He liked stimulants and quinine, and plenty of nourishment; was of opinion that he had seen contagious Pneumonia.

Mr. JAS. GOOCH spoke in favour of both hot rugs and blisters, with a minimum of medicine.

Mr. URQUHART had recently treated several cases with digitalis and carb. ammon., and had every reason to be satisfied with the result.

Mr. JOHN HAMMOND spoke highly of quinine and alcohol in early stages, thought that quinine lowered temperature very quickly; he usually applied blisters. He felt certain that he had seen a contagious as well as a non-contagious form of Pneumonia.

Mr. HUNTING, in reply, said he was very pleased with the reception his paper had met with and the discussion it produced. He did not believe in two forms of Pneumonia in the horse, and as to use of alcohol, although beneficial in early stages, he considered it very injurious to continue for long.

The meeting terminated with a most cordial vote of thanks to Mr. Hunting for his excellent paper, and to Mr. Hammond for acting so ably as chairman.

R. S. BARCHAM, *Hon Sec.*

SCOTTISH METROPOLITAN VETERINARY MEDICAL SOCIETY.

A MEETING of the above Society was held in the London Hotel, Edinburgh, on February 20th, the President, C. Cunningham, Esq., in the chair.

Present:—Messrs. Pottie, Robinson, Hutton, Storrie, Aitken, Boyd, Spreull, Thompson, Love, Bates; Professors Williams, senr. and junr., Lewis, McAlpin

and Hunter; Mr. Connochie, Mr. Young; some friends, and the representatives of the local press.

The following gentlemen were elected members of the Society:—Messrs. J. Cameron, M.R.C.V.S., Berwick; P. Manuel, M.R.C.V.S., Hawick; A. Bates, M.R.C.V.S., New Veterinary College; Professor Ivison Macadam, New Veterinary College.

The following gentlemen were nominated for membership:—Messrs. T. Connochie, M.R.C.V.S., Galashiels; T. Kay, M.R.C.V.S., Lochee; Love, M.R.C.V.S., Leith; and for hon. membership Mr. Young, Editor of the *N. B. Agriculturist.*

Letters of apology for absence from a number of members and friends were intimated.

In the absence of Prof. W. O. Williams, the SECRETARY opened the deferred discussion on Mr. Storrie's paper dealing with the measures to be adopted for the eradication of Tuberculosis.

The discussion was continued by Messrs. POTTIE, ROBINSON, CONNOCHIE, Professors WILLIAMS and HUNTER, and others, and was concluded by Prof. W. O. WILLIAMS moving as follows:—"That this Society, thoroughly believing that Tuberculosis is a systemic and contagious disease, urges upon Government to—

(1) Stop the sale of milk from animals suspected of being affected with Tuberculosis.

(2) Suppress the consumption of meat from tubercular animals.

(3) Give compensation for a limited number of years.

The PRESIDENT then called upon Mr. H. THOMPSON, M.R.C.V.S., Aspatria, who read the following paper on "Some Difficult Cases of Parturition met with during Thirty Years' Practice."

Mr. Chairman and Gentlemen,—The season is drawing nigh when country practitioners will be looking forward, some with great anticipation of having a good time out of the spring cases of difficult parturition; while others—old hands—will dread the ring of the midnight bell, calling them out of their snug, warm beds, for a long, cold drive; then to strip to the bare skin in some cold, comfortless, through-draughty byre, or in a filthy, damp loose-box. I may say, gentlemen, that I belong to the latter class, and, like Macbeth, say, "Hold, enough!" In bringing this paper before you, I will only take one case of each of the different presentations as an illustration of the many I have met with during a practice of thirty years. The same mode of operating usually answers in both mares and cows. First, is the natural presentation in a fat short-horn heifer; first calf. These cases have been very frequent with me, where the os uteri and ligaments are quite relaxed, but the vulva is constricted. The two fore-feet protrude through the vulva, and are usually seized by the attendants and pulled till both shoulders and head are jammed tight in the vagina. The fœtus is, however, generally extracted with a great deal of main strength and stupidity, and very often the vagina is so much torn that fatal hæmorrhage takes place. When the mother and fœtus are very valuable, my services have often been called in. My mode of procedure is to oil the hand well, introduce it into the passage, examining the head and all its surroundings; then pass a strong cord over the head and behind the ears of the calf, making a loop in front, outside the vulva. Then, by gentle traction on the cord, and manipulating with the other hand, I extract the head, occasionally pulling first one leg and then the other, when the fœtus is got away. But at times I meet with other difficulties. Well do I remember calving a very valuable heifer belonging to Sir Wilfrid Lawson, Bart., of Brayton. The bailiff and several of the labourers had pulled at the head and fore-legs from 9 a.m. till 2 in the afternoon, when one of the men said he would pull no longer, as he considered it cruel to punish the animal, as it was evident that

all was not right. They then sent for me, and on reaching the place I found the head and fore-limbs outside the vulva. I had no difficulty in passing my hand over the shoulder, as the fœtus was small. I found the abdomen of the calf enormously enlarged, and full of water. I said nothing to the attendants, but took my embryotomy knife and plunged it into the side of the calf, making a good opening, and at the next pain the fœtus came away without any assistance. I was extremely gratified to see the astonishment portrayed on the countenances of the bystanders, who had been tugging and pulling for over five hours. The animal did all right afterwards.

The next presentation I will take up is a very common one, both in the mare and the cow. It is where the two fore feet are presented, while the head is bent back, with the nose pointing behind the elbow. This case is sometimes very troublesome, but if called early, it is simply enough managed by passing a cord to the under-jaw, and giving it to an assistant to hold; then by pressing the fœtus back, and manipulating the head over the shoulder, I get it into the natural position, and the operation is soon finished. But sometimes, too frequently, some one has been there before me, and I find the fœtus dead, conphysematous, and the uterus contracted on its contents, and a nasty acid secretion is found in the womb, which prevents the hand being introduced with ease to make examination. In these cases, I generally have a quantity of linseed jelly made, which is strained, and then injected into the womb with Reid's Patent Enema Syringe. This is a great help in all protracted cases. It distends the walls of the uterus, and acts the part of the natural fluids. If I cannot get the head into position I proceed to remove the forelegs by passing an embryotomy knife as far as I can reach on to the shoulder of the fœtus, drawing the knife carefully and firmly along the whole length of the limb, cutting through the skin from the shoulder to the fetlock, or middle of the shank, as required, then with the fingers skin the legs up over the shoulders, and as far as I can reach. Strong cords have already been attached to the pastern, or above the knee, if practicable. I cut through the pectoral muscles and pull the limb away. The same is done with the other fore-leg, and having lost the support of the fore limbs, which have been holding it up, the fœtus drops down to the bottom of the womb. There is then a chance of reaching the head, and by the use of hooks sunk into the different parts of the neck, pressing the body of the fœtus back, I get the head into position, and extract the partially dismembered body. A somewhat similar presentation, but a very formidable one in the mare, occurs where the fore-limbs are found projecting from the vulva, with the head bent back and lying over the quarter of the fœtus. In fact, when the foal is got away its face is so concave that it fits exactly to the quarters. As I have already said, this is a very formidable presentation, and a frequent one in mares, for two or three labour pains are quite sufficient to jam the fœtus against the pelvis of the mother. I have made attempts without number to reach the eye socket, but could never touch further than the ear-tips; in fact, I believe it is impossible to turn the foal's head round, so long as the fore-legs are sticking out of the vulva, holding the fœtus up as it were, against the spine of the mother. Gentlemen, this is the presentation that, thirty years ago, caused such a commotion in the agricultural papers when Professor Gamgee failed to extract a foal from a mare at Burntisland. After working several hours, he pithed the mare, which set the late Professor Dick and others writing to the newspapers. The spring following, when a student, I read a communication before the Edinburgh Veterinary Medical Society, on difficult parturition, which I will presently refer to, as the case is still unique. Shortly after the reading of my paper, a case occurred a few miles out of Edinburgh, on a Sunday morning, when Professor Dick sent for me to go and operate, which I successfully accomplished under the supervision of the

late Professor Strangeways. And, gentlemen, I see one or two of my old college chums before me, who will remember Professor Dick lecturing on the case for several afternoons in the following week, more particularly so when Mr. Gamgee's students we present at his lectures. But to proceed, When I meet a case of this kind, I make a very careful examination, and if I cannot reach further than the ear-tips, I neither waste my strength nor that of my patient, but proceed at once to cut the foal away in the manner already described in the preceding case, by removing the forelegs and turning the head round. But I have met with cases of this kind both in the mare and cow, where I had to cut through between the ribs, twist one or two off, insert my hand into the thoracic and abdominal cavities of the fœtus, and remove their contents, before I could get the head right for extraction.

There are several others, which I will call minor cases, where the fore-legs are presented and the head turned on to the shoulder, or it may be with the nose pointing into the flank; or again, the head may be turned on to the fœtus' back, with the lower jaw upwards. These are removed in a somewhat similar manner to those already described, securing the legs and bringing the head round with cords or hooks, meanwhile pressing the fœtus back into the body of the womb.

I have also had the fore-legs presented with the head doubled down under the neck, and the occiput of the fœtus presented at the pelvic brim. I generally secure the legs with ropes, also put one round the lower jaw, or a hook into the eye-socket, press the fœtus back, and lift the head into position.

A somewhat formidable-looking presentation is met with, in which you have all the four feet in the vagina with the head thrown back out of reach. This can be made a very tedious and long operation, or very short, according to the manner of going about it. Well do I remember the first case of this kind, when I was with Mr. Carlisle, of Carlisle. An unqualified practitioner had worked from 2 till 10 p.m. We were sent for, and on arrival found both man and mare pretty well exhausted. He had been trying to put the foal into a natural position, by pulling the fore legs forward, pressing the hind ones back, and endeavouring to turn the head, which was lying on the quarter. As the two fore legs were projecting out of the vulva to above the knees, we removed them in the manner already described; then attached cords to the hind pasterns as they were just behind the brim of the pelvis of the mare. We pulled these forward, pressed the chest back, and removed the fœtus. This is a very common presentation in my practice. After fully satisfying myself, by careful examination, I attach cords to the hind pasterns, press the fore limbs back, pull first one hind leg and then the other through the vulva, and generally succeed in removal without any cutting whatever. But it frequently occurs that some one has been before me, and has pulled the fore legs too far out to be returned with safety to the mother; I then remove them at the shoulder, and take the hind legs as already described.

The next example I will take up will be that of Breech Presentation in the mare. When the tail only is presented, and you cannot find the point of the hocks, the case looks desperate. I will never forget the first case I saw when I was apprenticed to Mr. Fisher, of Whitehaven, thirty-four years ago, where two fully qualified veterinary surgeons and a quack worked sixteen hours on the case. The three operators were men standing good six feet high, with long reach; but they never could touch the hocks, nor pass a cord round the legs. They relieved each other in the work, but their united efforts failed to remove the fœtus, and the mare was shot. This case set Mr. Fisher thinking, and he devised my present mode of operation, and was the first, to my knowledge, to put it into practice. I have met a number of these cases, and generally succeed in extracting the foal in from two and a half to three hours. After careful examination, and satisfying myself that I cannot get the legs, only the

tail and quarters to be felt, I waste no time, but introduce my finger embryotomy-knife, reaching as far over to the stifle of the fœtus as possible; then I plunge the knife through the skin, and cut steadily through the tensor vagina (*Tensor fasciæ latæ*) and gluteals (Ext. and Max.), over the hip joint towards the tail, cutting and tearing down the tissues until I get to the joint. Then I divide the ligamentum teres, rather a difficult job, set the head of the femur at liberty, attach a good strong plough-cord around the neck of that bone, give it to an assistant to draw, then with the knife divide the muscles on the inside of the thigh, and for this purpose I find nothing beats the ordinary shoeing knife. The greatest difficulty is in cutting through the fascia and skin inside the thigh; but you will succeed in this as the limb is drawn top-end foremost out of the vagina. When the leg is removed, I next cut into the abdomen, pass in my hand and tear out all the viscera, both abdominal and thoracic, and attach a rope to the pelvic bones through the obturator foramen. I have an attendant steadily pulling while I press the remaining leg against the now emptied belly, and lift the fœtus into the mare's pelvis. This usually succeeds; but I have met with cases where I have had to remove both hind legs, as well as the viscera, before delivery could be accomplished. The next presentation falling to be noticed is where the hind legs have been presented transversely across the womb, with the points of the hocks opposite the os uteri, and neither the feet nor the stifles within reach. I have with difficulty cut one leg off by the hock joint and divided the tendo Achilles of the other, flexed the shank against the front of the tibia, first passing a cord round the joint, and then succeeded in extraction. One of these cases was about the hardest I ever met with.

Where the points of the hocks are found at the brim of the mare's pelvis, by pressing the fœtus forward with the repeller, and pushing the hocks up towards the spine of the mother, with my hands round the toes, flexing them against the fetlocks, I succeed in getting the hind feet forward, with delivery. In consequence these breach presentations are generally very simply remedied in the manner just shown.

Ectopia abdominis in the calf, where the hind legs are doubled forward over the back and on to the shoulders, with head and fore extremities flexed backwards, also on the shoulders. The walls of the abdomen are reflected partly over the limbs and head, while the bowels are floating loose in the uterus of the cow. I proceed by removing all the abdominal viscera of the fœtus, then with a good knife—shoeing knife for preference—cut through the spine and reflected integuments, the latter of which is the more difficult; then with hooks, take either the hind or fore portion—whichever is most favourably presented—and pull it away.

Ectopia cardis and *Ectopia cerebralis* I have met with, but they are generally easily enough got away. The case that Professor Dick sent me to, when a student, was one of *Ectopia cerebralis*.

Hydrocephalus in the calf I have also come across, where I simply pass the embryotomy knife into the bladder-like head, when extraction becomes simple. I never had a case of a calf with double heads, nor one with two bodies joined together. Twin calves I have delivered on many occasions, being very careful in examining and securing the legs proper to each calf. I have sometimes seen the foreleg of one, and a hind-leg of another calf, drawn into the passage, and the head of one and the legs of another.

I have come across several cases of constriction of the os uteri in the cow; it is known in Cumberland as "Horney Lyes," and, writing from memory, I have only used the knife about three times, and then only making three slight incisions, one superiorly, and two supero-laterally on the constricted neck. I smear the parts well with Extract belladonnæ, and give the animal ʒij of Gum opium suspended in hot water, and wait a few hours before attempting

removal. If the labour pains are very strong, I pass a strong cord round the body of the mother; through this cord I put a stout stick, which is used by an attendant standing by, to twitch and tighten the rope, thus preventing the abdominal muscles from strong and violent action until the opium takes effect. After making the incisions, it is a great mistake to proceed at once to deliver the cow; not only have patience, *but exercise it*. I generally find the Belladonna application, the opium, and the body twitch, with the exercised patience, to succeed without any cutting whatever.

Cæsarean Section.—In the mare I have twice attempted to save the offspring by sacrificing the life of the mother. Both foals lived—one twenty-four and the other thirty hours. In sheep, when the offspring are valuable, I frequently remove live lambs by this section, and with the greatest success, but always kill the mother. If there is one thing more than another that I have a decided antipathy to it is to act as accoucheur to a young sow; you never know when they are finished. I have seen them go on for seven or eight days, and do well. My son, the late John Fisher Thompson, was very fond of the Cæsarean section in young sows. In two instances, when he removed seven pigs from one and nine from another, the mothers lived for two days after the operation; but both cases had been four days in labour before he saw them. He always entertained the idea that if he had a good start that the operation would be successful. He also on two occasions removed calves from the sides of the mothers. The calves lived, but the mothers were killed, as one had Heart Disease and the other an abscess on the brain.

Of Torsion of the neck of the uterus I have had four cases:—First, a complete twist, when the animal was killed, and the other three were from half to three-quarters twist. In one cow—a blue-grey polled—when on her legs, the twist felt as if it was complete, but when cast, and on her right side, it appeared to be only half. I introduced my hand, and as the fœtus was in its natural position, I seized both fore-legs, and told the attendants to turn the cow on to her left side. I then attached ropes to the pasterns and gave them to an assistant to apply steady traction, meanwhile introducing my hand as far as possible. I ordered the cow to be turned over again on to her right side, but when on her back, by my pressing to the right, the cow going to the left, and the assistants steadily pulling at the ropes, the uterus seemed suddenly to right itself, and the calf was extracted with the greatest ease, not only astonishing the parties present, but also myself. This case had been going on for three days, and was attended by an unqualified practitioner. Gentlemen, you can imagine my delight when I found the calf was alive. The other two cases were half-twists, and on securing the legs, pulling steadily, and jamming them into the half-twist, the animal suddenly dropped on to the side that the twist was from, and as suddenly the uterus righted, rendering delivery easy.

I have also seen two cases of retention of the fœtus in cows. At the end of the gestation period, the pelvic ligaments became relaxed, vulvas freshened, udders distended, and teats stiffened and pointed—all seeming in full and natural condition for calving, but never any symptoms of labour pains. Finally, the ligaments tightened up, the udder shrunk and the animal commenced feeding. One was made fat and sent to the butcher; the other was turned out to grass, fell into a watering ditch, and was drowned. Strange to say, I saw these cows at various times for over twelve months, and at intervals removed from the rectum different bones belonging to the fœtus; one side of the under jaw, scapula, ribs, humerus, and several others. These are interesting cases, and quite sufficient for a paper themselves.

In my district several flocks of well-bred sheep are kept, and my services are often required. In very frosty weather I frequently meet with eversion of the vagina, particularly the upper portion, with the os uteri constricted, and

the ewe very much pained. I smear the vagina all over with extract of belladonna, and return it. Then to keep it in position till the os dilates, I put two stitches of tape across the vulva, and give the sheep from 8 to 10 ʒ linseed oil, and ʒss. of Tinct. Opii. P.B. If the weather is mild they generally do well, but in severe frost they may end in inflammation and gangrene.

I will now relate the case which I read as a communication when a student, as I think it is still unique. It occurred in the practice of Mr. John Fisher, of Whitehaven, with whom I served an apprenticeship.

The case was that of a draught mare, and the foal a complicated monstrosity, with anchylosis of the articulations. The ears and poll of the fœtus were presented at the os uteri, with the foal lying partly on the off side, both fore extremities extended right backwards along the belly, and the pasterns hooked behind the thighs. The hind legs pointed down and towards the pelvis, with the feet turned up, and the backs of fetlocks pressing against the os pubis of the mother. The knee could be reached, but the limbs would not stir, all the joints being rigid. The ears and poll, as I have said, were presented with the chin pressing against the lower portion of the neck. Numerous attempts were made to lift it into position, and finally the head was cut off with great difficulty, at the atlo-axoid articulation. A rope was then put round the neck as far down as possible, but the fœtus would not stir. The shoulder was next cut off, and another strong cord put round it, when, by steady traction, the shoulder blade became detached. The cord was then put round the humerus, and three strong men had great difficulty in pulling the limb away, owing to the hooking of the pasterns round the thigh. The belly was next cut into, and the sternum removed by cutting through the cartilage on each side. All the thoracic and abdominal viscera were cleared out, and the knife was then passed between each rib, dividing the inter-costal muscles in their entire length, and each rib twisted off at the articulation, until nothing but the soft parts remained on one side. The hind feet were pressed into the chest and abdomen, close up to and along the spine of the foal, and powerful traction applied to the rope around the neck, when, for the first time, the fœtus was felt to give way, and after a little patience its remains were extracted. The operation occupied four hours, Mr. Fisher being the chief operator. The instruments used were scalpel and prob-pointed bistoury. The mare was put to work in about ten days after.

In all cases of difficult parturition in the mare, I generally wait about six hours, and if by that time the afterbirth does not come away, I proceed to remove it. Then I wash the uterus well out with two or three gallons of tepid water, and after this has been expelled, I inject into the uterus two gallons of tepid water and one ounce of Tinct. Ferri Perchlor. I give the following draught:—

R. Ol Lini..	.. ..	Oj.
Tinct. Opii..	.. ..	ʒij. equal to ʒij. Opii Pulv.
Spir. Ammon. Arom.	.. .. ..	ʒj. to ʒij.

In fit. haust.

And leave the mare.

I have noticed that in some seasons the retention of the placenta appears almost as an epidemic. If it is not removed within twelve hours after parturition it is usually followed by laminitis or pyæmia and death. Great care should be used in removing the placenta from a mare, the least portion left will cause a great amount of constitutional disturbance. Mares out at grass can retain the placenta a much longer time, without any bad effects than those in the stable—at least I have found it so. I remember one night being hastily summoned out of bed to go to a mare said to have "shot the

foal bed." I found the box full of people, and the mare lying very quiet and comfortable, and from her position I was satisfied that no eversion had taken place. I walked quietly up to her, and put my hand into the vulva and found all right. I then asked where the "foal bed" was. The owner replied that he had it in a large cream pot, among warm milk and water to keep it from getting cold. I had it fetched, and on putting my hand in brought to view a "foal bed" sure enough—a big cleansing, which I pitched on to the manure heap, telling the farmer that the mare could do without that till she got another like it.

I may also note a few serious accidents I have met with in parturition in the mare. I have several times seen the fore-foot of the fœtus pressed through the top of the vagina, into the rectum, and out at the anus. If there in time, all haste must be exercised in pushing the fœtus back, and putting the foot into its proper position. The wound thus made never heals up, as the parts are never at rest, because of the muscular action of the rectum. Some of the fæces pass out through the vulva. I have known mares breed with this defect, without any bad consequences. Again, the same accident is succeeded by more serious results, when, by the pains of the mother, the limb tears through the sphincter ani and perineum, making the anus and vulva into one. This, of course, never heals, and fæces and urine come from one common opening. In these cases I have seen immense sloughing of the neighbouring parts.

Eversion of the uterus is very common in the cow, and in many cases the organ is returned with difficulty; but in the mare it is extremely rare. As these are cases consequent to parturition, I will not enter into them.

About twenty-seven years ago, I met with a case of eversion of the bladder in a mare that had just foaled. She was standing, occasionally pained, with a constant dribble of urine from a yellowish blue bag hanging from the vulva, and which on examination proved to be the bladder, as the upper portion of the meatus could be felt. I returned it quite easily, but I had no sooner removed my hand than out it popped again. This was repeated several times, till, after returning it for about the fourth time, I rubbed a caustic pencil round the meatus. I then had her walked quickly about, occasionally dashing buckets of cold water on the vulva, and then gave her ʒij. gum opium in a draught. The bladder was retained and the mare did well. About two years ago, my assistant, W. F. Shore, came across a case in which he returned the bladder without any difficulty. In this case the mare not only delivered the foal and everted the bladder, but a loop of the bowel was pressed through the mesentery, causing strangulation. Of course the mare died.

Post-Partum Hæmorrhage.—In these cases I have a cotton bed-sheet put into a bucket of cold water, to which is added one or two ounces of Tinct. of Iron. The cloth is partly wrung out, and then I packed it into the vaginal canal, leaving it till it comes away by itself, in the same way as if the animal was cleaning, the animal meanwhile being kept quiet.

The discussion of Mr. Thompson's paper being deferred till a future occasion, votes of thanks were awarded to the essayists and to the President.

The members subsequently dined together, pleasantly ending a most interesting and instructive meeting.

R. RUTHERFORD, *Hon. Sec.*

ROYAL AGRICULTURAL SOCIETY.

AT the Monthly Meeting of the above Society on March 6th, Mr. DENT stated that Professor Brown had presented the following report:—

"*Pleuro-pneumonia.*—During the month of February forty-seven fresh outbreaks of this disease were reported in Great Britain. Of these, thirty-

one were in England, in the counties of Cumberland, Durham, Essex, Kent, Lancaster, Middlesex, Norfolk, Northumberland, Somerset, York (North and West Ridings). The sixteen reported in Scotland occurred in Edinburgh, Fife, Lanark, and Linlithgow; ten were in city and county Edinburgh. The number of cattle attacked was 118, and 750 others which had been exposed to infection were slaughtered healthy. In Ireland seventeen outbreaks were reported during the month in the North and South Dublin Unions; twenty-three cattle were attacked, and 159 healthy animals in contact were slaughtered.

"*Anthrax.*—There were twelve outbreaks of this affection reported in February, eleven of them in England and one in Scotland.

"*Swine Fever.* — In February 304 outbreaks of Swine Fever were reported. This is a decrease of twenty-four as compared with the preceding four weeks. There were 2,080 swine attacked; 991 diseased swine were killed, 906 died, 133 recovered, while 452 remained alive when the return was made up.

"Several important inquiries into outbreaks of disease among farm stock were conducted during the last month. These cases will be referred to in the Quarterly Report which will be laid before the Committee at their next meeting.

"It is necessary to announce that an Order of Council has been passed to come into force on the 1st of June, under which cattle and sheep from the Netherlands may be landed in Great Britain without being subject to slaughter or quarantine."

A letter had been read from Lord Cranbrook to His Royal Highness the Prince of Wales, dated the 8th February, acknowledging the receipt of a copy of the resolution passed by the Council at its last meeting with regard to Pleuro-pneumonia, and assuring His Royal Highness that the subject referred to would receive the consideration of the Department and the Government.

In accordance with instructions from the Council, the Secretary had communicated with the Highland and Agricultural Society of Scotland with regard to the appointment of delegates from that Society to attend a proposed joint deputation from the three National Societies to the Lord President on the subject of cross-Channel traffic in cattle; and a letter had been received from the Secretary of the Highland Society stating that he would bring the matter before his Directors on the 6th inst., in order that they might appoint representatives. A resolution on the subject had been also received from the North-West of Ireland Agricultural Society.

The Committee recommended the appointment of the following gentlemen as Provincial Veterinary Surgeons:—

Mr. William Aulton, of Derby, for Derbyshire.

Mr. Robert Gibbs, of Taunton, for South Somerset.

Mr. David Evans, of Haverfordwest, for Pembrokeshire.

Mr. William Hunting, of 16, Fulham-road, for the Metropolis and Middlesex.

Mr. JACOB WILSON asked, with regard to Pleuro-pneumonia in Ireland, if Professor Brown could inform them whether the disease was prevalent outside the Dublin Unions. A charge was being made against Irish cattle generally, that they introduced Pleuro-pneumonia into Great Britain, and it ought to be known whether this applied to the whole of Ireland, or to any particular part.

Professor BROWN replied that, according to the reports, the disease was entirely confined to the North and South Dublin Unions, and had no connection with any other part of Ireland.

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE annual meeting of this Association was held on February 22nd, at the Grand Hotel, Birmingham. Mr. Trigger presided, and there were present Professor Penberthy, of London; Drs. Barling, Foxwell, Manley, and Parker, Birmingham; Messrs. Wolstenholme, Manchester; Lodge, Dewsbury; Parker, Gamgee, Wilson, Price, Stanley, Birmingham; Barling, Ross; Owen, Rugby; Carless, Perrins, Worcester; Coe, Stoke; Pritchard, Beddard, Wolverhampton; Freer, Uppingham; Dawes, Collett, West Bromwich; Merrick, Northampton; Blakeway, Stourbridge; Blakeway, Birmingham; Olver, Tamworth; F. C. Golden, Martham; F. Taylor, Stourbridge; E. Wartnaby, Burton; G. Smith, Tunstall; H. Perrins, Worcester; Russell, Sandiacre; the Treasurer, F. Blakeway; and the Secretary, J. Malcolm.

The TREASURER read his annual report, which was as follows: Balance from 1888, £117 17s. 7d.; moneys received during last year, £35 8s. 5d.; money paid during last year, £17 17s. 4d.; balance in bank, £135 8s. 8d. He added that there seemed to be, year by year, an increasing negligence on the part of members with respect to the payment of their subscriptions. Taking into consideration the smallness of the sum, this was far from creditable, and it did away with any little bank interest which might accrue.

Mr. G. SMITH moved, and Mr. MEYRICK seconded, the adoption of the report. The motion was agreed to unanimously.

The PRESIDENT proposed as his successor Mr. Beddard, of Wolverhampton. He said that that gentleman had rendered excellent service as Hon. Secretary of the Association, and they could not consult their interests better than by electing him as their President.

Mr. COE seconded the resolution and it was adopted.

By the rules of the Association, Mr. Trigger becomes one of the Vice-Presidents. Mr. F. W. Barling and Mr. Meyrick, Jun., were unanimously elected as the other two. The Hon. Treasurer and the Hon. Secretary were re-elected. After some discussion, it was resolved that the Hon. Secretary should ascertain which gentlemen were eligible for election on the Council of the body corporate, and that a canvass of the members should be made by circular, with a view to the selection of the Midland Association's nominee.

The HON. SECRETARY read a letter from Mr. Hunting, acknowledging his election as an honorary associate. The letter was as follows:—

"16, Fulham-road, London, S.W.

"Dear Mr. Malcolm,—Please accept my best thanks for your letter informing me of the honour done me by the Midland Counties Veterinary Association, and please tell the members I am very grateful to them for their recognition of my poor endeavours to help forward the progress of our profession. Of course I cannot repay, by any means, an honour conferred by an Association, but I should only be too glad at any time to prove by action my thorough appreciation of their courtesy.

"Our Veterinary Medical Associations are vital parts of our profession now, and their influence directs the progress of the whole body. Such influence entails grave duties and responsibilities, which it is to be hoped we all recognise.

"Again thanking you for your highly valued honour,

"I am yours obediently,

"W. HUNTING."

The PRESIDENT then introduced Professor Penberthy, assuring him of a hearty welcome.

Professor PENBERTHY, who was warmly applauded, then read a paper on—

SOME DISEASES COMMUNICABLE FROM ANIMALS TO MAN.

Some months ago your President did me the honour of inviting me to introduce a subject for discussion at this or a previous meeting. I then

mentioned "Some Laws pertaining to the Heredity of Disease." It must be obvious that, in the meantime, circumstances have transpired to attract special attention to this matter, and to cause an alteration in our intentions. Your President and Secretary then kindly named "Diseases Communicable from the Lower Animals to Man" as one which would be acceptable, and notwithstanding the fact that it had occupied so much of our thought of late, it affords me much pleasure to be allowed to initiate another discussion on it.

To discuss the whole subject in detail in the time at our disposal we do not presume, but I think its paramount importance to us as a profession, and to the community at large, furnishes an excuse for the devotion of a little more of our attention to its consideration. I may say at the outset that I am fully conscious of rendering myself liable to an accusation of temerity for undertaking the task, and ask your forbearance with incompleteness which must necessarily exist. To enter fully into the subject would entail the traverse of the whole region of comparative pathology. This brings us face to face with our subject, and our most important functions, as conservators of human life and health, and of the means wherewith these unspeakable benefits may be rendered available to the individual and to humanity at large. In proportion to the appreciation of our power to achieve in this direction must be our individual and collective professional credit, and those rewards which should accrue to the loftiest aims of which man is capable. We shall not be detracting from the importance of other branches of our work if we say that from our efforts in this direction we must especially anticipate the recognition of our true professional and social position.

In my humble opinion, we, as a profession, have been prone to regard disease and medicine in too restricted and limited a sense. We are too accustomed to imagine a possible division into classes named human and veterinary. Though there may be one flesh of beasts, and another of birds, and another of fishes, there is to my mind *but one "pathology,"* one set of principles of medicine and surgery. The practice of these principles is certainly and properly divided, and rightly occupies the attention of two professions only in details of practice separate. The recognition of the universal application of the principles of pathology is calculated not only to simplify our studies, but to extend our usefulness and influence for good.

As the light of experimental research is being shed on the cause of disease, our ideas as to its after expression are becoming more defined, and our methods of dealing with these more intelligible, and easy, and effectual. It is interesting to remark what truth underlies the ancient axiom, "Remove the cause, and the effect will follow," and the advance of our knowledge in the direction of understanding "the cause."

When it is possible, and happily every year seems to increase the possibilities, the contagious disease must be studied with the natural history of its producing factor, and the power of this to induce morbid phenomena, as well as the facilities or resistance offered by the tissues of the organism to which it has gained access.

Modern investigation of the subject and our ordinary views of the principles of life and matter render it almost impossible for the trained mind to conceive of a disease being contagious in the usual sense unless its producing factor be a living entity or immediately associated with it. Its power of multiplication almost forces the conclusion. It is true that the exact nature of all diseases has not yet been satisfactorily demonstrated, but we must for a moment reflect, and consider what our positive knowledge on the subject was a quarter of a century since, and what absolutely fresh views we are now compelled to take. At no period of the world's history could it be said that science afforded no fresh fields. Our present position leads us to regard the theory of spontaneous generation of contagious disease as a most pernicious doctrine, one at discord with our evidence of natural law and order.

In those easily demonstrable conditions known as infective granulomata—Glanders, Tuberculosis, Actinomycosis, etc.—the relation of the cause to the local effect is perfectly clear. In other diseases, as Anthrax, etc., the mode of action may be sometimes different and not so easy of demonstration, but the association with the virus is quite as convincing.

To-day I ask your indulgence while I refer to some of what I regard as the more interesting points specially in connection with the *materies morbi*—the cause of those diseases in question—and to enlarge on those phases of its natural history which suggest special means of prevention or cure. We do not touch on conditions of which our special patients may be the mechanical means of conveyance from the diseased to the healthy.

It is natural that in contemplating this matter the question should arise why a virus should not exert the same influence in one animal or species as in another. Obviously the reply must be of a hypothetical character. The suitable soil and surrounding conditions, the selective affinity manifested throughout the vegetable and animal kingdoms, all lead us up to general laws. It has been suggested that in the insusceptible animal there is either deficiency of an essential or something additional which is antidotal or antagonistic. From the fact that bacilli which induce a certain disease will grow in broth made from tissues of an insusceptible animal, and then induce the disease in a susceptible animal, we are led to the inference that there is something of a vital nature in the insusceptible animal to account for the resistance. The general behaviour of white corpuscles towards bacteria has caused them to be regarded as in some way connected with this immunity. If watched in living tissues they are seen to be the natural warriors against such particulate matter.

Other circumstances may obtain and assist in the protective powers. Pasteur states that though fowls do not under ordinary circumstances contract Anthrax, if they be immersed in cold water so as to reduce the temperature to the mammalian standard they become affected and die.

Though from time immemorial it has been the custom to regard some diseases of animals as transmissible to man, little but vague speculation was associated with it until recent years. The disposition at the present day is to add to the list of such conditions. I fear sometimes enthusiasts are carried beyond the region of observed facts and discretion. Precipitation and generalities are to be as far as possible avoided, but we must not forget that it is even safer to err on this than on the other side, though I cannot refrain from saying that on our own part the greatest caution should be used in making statements or receiving them. The capacity for being duped in this direction is not small. I think that until a matter as to intercommunicability is safely and soundly established it should be discussed only amongst professional or scientific men, for first impressions are not readily erased from the lay mind. This state of caution need not deter us from using every means at our disposal for the discovery or substantiation of such conditions as may possibly exist. During the existence of epizootics and epidemics it is our duty to watch for evidence of connection, and of course it is most desirable that the practitioners of both branches of medicine should be in accord.

In these considerations we must not forget that the contagious and intercommunicable disease does not always manifest itself in the same way in all susceptible species. The Rabies poison may induce Paralysis in rabbits, Hydrophobia in man; Splenic Apoplexy, malignant pustule in man; malignant Small-pox of man, a benign condition in the cow.

The more important and practical points demanding our attention appear to me to be the recognition of the disease in its earliest phases, the manner in which it may be propagated or disseminated whether by mediate or immediate contagion, the period during which an affected animal may be

capable of spreading the disease, and the length of time during which the virus outside of the body retains the power of exciting the disease; as well as any circumstances which modify any of these conditions.

Speaking of these diseases separately, Anthrax (*Charbon*) is perhaps the best understood of those with which we propose to deal. Its cause is inseparable from the organism known as the *Bacillus anthracis*. This bacillus, itself very delicate and easily destroyed, rapidly multiplies under favourable conditions, forming spores which are much more tenacious of life. These spores resist the action of heat and cold, comparatively strong disinfectants, and live for long periods outside the body, putrefaction having little effect on them. For the development of spores and bacilli free access of air is essential, but while putrefaction destroys the bacilli, the spores remain, without oxygen, alive though dormant.

In an affected animal bacilli may exist only in very small numbers within a short time prior to death; *in articulo mortis* and after, with access of air, they develop rapidly. They are most generally met with in the blood, but the discharge from eyes, nostrils, etc., also usually contains them.

In Great Britain Anthrax is most frequently recognised in the ox in the form known as Splenic Apoplexy or Fever; other ruminants (sheep, etc.), the horse, ass, pig, rabbit, and least in carnivora, are all affected. It is very, though not absolutely, fatal. Its attack is sudden, period of incubation very short (from twenty-four hours to three days), and its after course in fatal cases rarely protracted beyond two days.

A heightened temperature is the earliest sign, but *post-mortem* examination is what we usually have first to deal with. The discovery of the *Bacillus anthracis* is necessary before we can positively state (of any condition) that it is Anthrax.

There is ample evidence of its being communicable to man, on whom it manifests itself in three forms, which seem to have distinctive features, important for us to remember.

Malignant pustule, or Charbon, in which bacilli are usually found only in the local lesion. If active treatment is not early adopted the blood stream and other parts contain them in greater or smaller numbers. Excision of the local lesion and cauterisation often prevent the spread, and Guy's Hospital Reports give forty-eight cases treated, and thirty-nine recovered. Malignant pustule is probably produced by inoculation (and at the seat) with bacilli, and is consequently the form most likely to follow manipulation of carcases or parts of animals recently dead. This is compatible with general experience and laboratory experiment.

Intestinal Anthrax, in which the mucous membranes of stomach and intestines manifest the local lesion; the mucous and sub-mucous tissue is largely infiltrated with a gelatine form exudate; softened and enlarged spleen and mesenteric glands. The infection is usually general, and the effect usually fatal.

Pulmonary Anthrax, or wool-sorter's disease, in which the pharynx is congested, the bronchial mucus tinged with blood and of a musty colour, bronchial glands infiltrated and softened, lungs in varied morbid states, ecchymoses in various parts of the body. This is also a fatal form, but if the patient do not succumb in a few days recovery is usual.

In Intestinal and Pulmonary Anthrax the general infection appears to be associated in the one case with ingestion of spores, in the other with the inhalation of spores. This is supported by the fact that the intestinal form is met with after the consumption of improperly cooked or uncooked flesh from affected animals, and the latter—pulmonary—among workers with certain classes of wool which has been subjected to conditions favourable to the development of spores and their being inhaled, those who open bags of

wool imported from countries where Anthrax is known to prevail, and those in drying-rooms where spores are likely to be mixed with the atmosphere.

It is not, then, peculiar that we meet with malignant pustule in workers with hides, slaughterers, and veterinary surgeons, and that Guy's Hospital, around which are situated our large hide-dressing establishments, should furnish so many instances of it; nor that wool-sorters' disease should have a kind of natural connection with Bradford, though it is by no means confined to that city.

Intestinal Anthrax is comparatively little recognised, and indeed during life, independent of the history, most difficult of recognition. I am inclined to think it may be more common than we believe. Cooking of food is of course a potent factor in lessening the risk in the human subject.

With the curative treatment of our patients the recent orders attached to the Contagious Diseases (Animals) Act forbid our dealing. My experience tells me that it is not an absolutely fatal condition. When external Anthrax is localised excision, cauterisation, and the internal administration of such agents as quinine, perchloride of mercury, etc., are sometimes attended with recovery.

The preventive measures will be based on our knowledge of the facilities afforded by the animal and vegetable pabulum, the free access of air to the development of spores, their great powers of resistance, and the different means by which they may gain entrance to the body. Though bacilli soon succumb to conditions of putrefaction, the spores seem to defy ordinary agencies of destruction for unmeasured periods. The channels of distribution are as numerous as mechanical means of conveyance and quite beyond enumeration. Carcases should be disposed of immediately with unbroken hide to prevent the formation of spores, and with due regard to the virulence of the excretions and secretions. Burning, if practicable, would be best. If burying is to be the mode of disposal a spot below the level of the springs and water-courses should, if possible, be chosen. If practicable, too, it is well to bury them where they died. Excretions which have had free access of air should be submitted to the action of fire or some other powerful disinfectant, H_2SO_2 being about the best.

Bleeding cannot, of course, be too strongly condemned, from this and every point of view.

Glanders.—Though for a long period recognised as *the* disease communicable from the horse to man, it has remained for recent research to make the most important additions to its pathology. A very short organism *(Bacillus mallei)*, about the size of that of Tubercle, and in some other respects like it, has been discovered, and pure cultivations produce most virulent and characteristic Glanders.

It appears beyond doubt that this bacillus is the disease-producing agent. It is more commonly found in young than in old lesions, grows in serum in droplets, and on potato in a characteristic fashion. Experiment tells us, too, that though we most frequently meet with Glanders in the horse and ass, and though more fatal to these, that many other animals are susceptible. We have recently met with cases in lions, cats, dogs, and guinea-pigs. The latter, especially the old, seem to recover in many cases. I am disposed to believe that in other animals than the horse Glanders exists more commonly than we have supposed. When we consider the source of food supply of our domesticated and captured carnivora in large towns, this view receives support. Virulent matter inoculated into guinea-pigs in the course of three or four days produces *in loco* an ulcer similar to that observed in the Schneiderian membrane of the horse, swelling of the lymphatic glands connected with the lesion, infarctions, and characteristic nodules in various parts of the body, particularly lungs, spleen, ovaries, and gut. The smaller the amount of virus

injected the greater is the tendency to the chronic forms. The shortest period of inoculation I have been able to register is in the instance of an ass, when after inoculation with a cultivation of the bacillus the temperature was 105 in twenty-four hours, and in three days characteristic changes were going on in the Schneiderian membrane.

I am not aware of any direct experiment bearing on the length of time during which the virus of Glanders outside the body under ordinary conditions retains its power of producing disease, but some circumstances point to this as being considerable. In the horse probably the commonest mode of infection is through the respiratory membranes, though entrance through abraded surface is not rare. I have seen two cases of infection of the intestines.

In the human subject, in which the disease is known as Equinia, Malleus, Maliasmus, etc., the entrance of the virus is perhaps most commonly through a wound. In him we find the acute and chronic forms, the former very fatal; Bollinger states that only one out of thirty-eight authenticated cases recovered; of chronic cases seventeen were fatal out of thirty-four. Fagge says that the human subject is not very susceptible; I presume he refers to contraction through the respiratory membrane.

In the acute form papules, soon running into vesicles sometimes as large as a sixpence, form and are connected with Farcy-like swellings, and ulceration follows; the glands are comparatively rarely affected; nasal discharge may or may not exist.

Inoculation in the ass is usually followed by a short period of incubation and death in from nine to twenty-five days.

Our prophylactic measures cannot be separated from the existence of a living particulate organism which we cannot conceive as arising spontaneously. This is capable of propagating Glanders, probably by the normal mucous membranes of the air passages and intestinal canal, and certainly by abraided surfaces. Our chief, though not exclusive concern appears to be with those connected with horses, as stablemen and their families, living in and about stables. The ease with which dogs and cats may be affected should always be borne in mind.

The measure instigated by most philanthropic and so far praiseworthy sentiments I cannot allow to pass without remark; I refer to our open water-troughs, which in my opinion are the most common and facile channels of communication of Glanders to horses, and through them to man. Only yesterday week two cases of Glanders, with ulceration of the Schneiderian membrane and copious nasal discharge, were brought for my inspection at our "gratuitous practice," both of which had drunk at the troughs on their way to the College. These suggest their own remedy.

Rabies and Hydrophobia.—The susceptibility of the human subject to Hydrophobia after inoculation of the rabific virus has been long known. The exact nature of the virus has not yet been satisfactorily determined. Rabies is said to manifest itself in two forms—the dumb and ferocious. In all cases it would appear that the brain and spinal cord are more potent in producing the disease; that in those situations the virus is most plentiful or active. It also exists to a lesser degree in the secretions and other parts of the body. Probably after the death of the rabid animal under ordinary circumstances the virus outside the body does not retain its vitality very long. After entering the body of a susceptible animal, it manifests its activity at various periods. Its period of incubation is probably very extensive—sometimes, it is said, four or five years—and we know that symptoms often manifest themselves in ten to fourteen days.

Subdural injection is by far the most certain way of producing it. The time which elapses between the inception of the virus and the manifestation of the earliest symptoms would seem to be some standard or criterion as to

the virulence or mortality of Rabies, though this is not a fixed rule. The shorter the period of incubation the more rapidly fatal the result.

Rabies virus passed through a series of rabbits gains virulence up to a certain number of transmissions; passed through monkeys its virulence is much lessened and period of incubation increased. Rabies is most often met with in the dog, and next in order in the cat, wolf, horse, deer, ox, sheep, rabbits, etc. In ninety-nine out of one hundred inoculated rabbits the paralytic form is to be observed.

In the human subject the symptoms are usually of a paroxysmal character, with dread of water and inability to swallow, etc.

Men are usually inoculated by being bitten by rabid animals. They are not so susceptible as the dog. We have no record of transference of Rabies from man to man. Pasteur has adopted and very largely carried out a practice of protective inoculation by which he believes that he affords extensive protection, and that it is effectual even during some time after the period of incubation. All who have made a careful study of M. Pasteur's work seem to agree up to a certain point with his statement; the matter is, however, still *sub judice*. If it be found effectual and practical one might suppose that all puppies should be thus protected.

Short of this, I think muzzling for, we will say, twelve months, and the perpetual quarantine by muzzling for twelve or eighteen months of all dogs imported into this country. Dr. Drysdale, writing in yesterday's *Morning Post*, refers to the decrease of Rabies during the period of muzzling in London, and its increase since the withdrawal of the order.

Tuberculosis, a condition so widespread among men and animals, is to us a matter of the highest importance, but inasmuch as it was lucidly dealt with at your last meeting by our friend Mr. Olver, I will touch but very briefly on it. In one or other of its forms Tuberculosis is most often recognised by us in the ox. Statistics indicate that the order of occurrence is as follows: man, milch cows, fowls, rodents, pigs, goats, sheep, horses, and carnivora; also that females and the young are more commonly affected than males and adults.

Heredity.—Starvation, bad ventilation, prolonged lactation, and other exhausting conditions appear to predispose to the disease; but Koch's fruitful discovery has decided that the active agent is the *Bacillus tuberculosis*. This is an extremely small organism, about one-third diameter of a red blood corpuscle, motionless, slow of growth, persistently retaining stains, and if cultivations of it are introduced to the susceptible animal Tuberculosis results. Growth and development appear not to occur except between temperatures of 86 and 105°. But this by no means allows of the inference that the bacilli or spores *die* or become incompetent below or above these degrees. Kept at 107° F. for several weeks, the virus dies. It is said that *Bacillus tuberculosis* desiccated for months, and then moistened and introduced into the animal body, has produced Tubercle. M. Cornet, in the *Revue Scientifique*, says that by sponging dust from walls of a compartment in which tuberculous patients have been located, and then washing and reproducing in sterilised broth, active tubercle bacilli have been found. He also induced Tuberculosis in animals by inoculation with the placenta of tuberculous females and semen from testicles of males. The bacillus is said to have been found in ovaries and spermatozoa, and well-marked Tuberculosis in a seven months' calf in utero, and Tuberculosis seems to be much more easily and rapidly induced by entrances through natural passages than by introducing into the subcutaneous tissue.

There would seem little doubt that the Tuberculosis of the lower animal is communicable to the human subject; indeed, that these are only manifestations of the same virus. Minor points of difference between the bacilli and the

lesion perhaps exist, but the tissues of various animals may, we think, to some extent modify the result. The bovine bacilli are said to be smaller, finer, more certain of inducing the disease in rabbits, and producing more rapidly general lesions in the guinea-pig. They are also said to be more common in the fresh lesion in the human subject, and in the causeating in the ox. Dr. Crighton would appear to try to show that man is the subject of two distinct forms of disease, one proper to himself, the other proper to bovines, but he has by no means made it clear. Though direct and positive evidence may perhaps be wanting to warrant us in calling the Tuberculosis in man and oxen identical, there seems some room for doubt that such is the case. It is obvious that direct experiment, *i.e.*, the inoculation of the human subject, is not in the present state of our social laws possible. Apparent proof from converse experiment is not wanting, for Tuberculosis has been again and again induced in the lower animals by introducing human tubercle bacilli, and much collateral evidence of the intercommunicability exists. Milk is a favourable medium for both development and conveyance of the virus. Dr. Sims Woodhead and others have observed that Tuberculosis in young children is most often confined to the mesenteric glands, and that in the lower part of the small intestines the course of invasion could be traced along the line of lymphatics usual to absorption, and when Tubercular Meningitis has existed lesions in mesenteric glands and abdomen appear older than others in the body. The bacillus is not evenly distributed through the system of the affected animal; it is probably only found in large numbers in and about the specific lesions. In oxen the lungs and pleura are more commonly affected; in the pig and sheep, the glands of neck; fowls, mouth, nose, spleen, intestines, and liver; rodents, spleen, liver, and lungs; horse, glands, spleen, (in form of so-called Lymphadenoma); man, lungs, glands, joints, nervous system. Muscles in all animals rarely affected. The secretions sometimes contain bacilli. When the udder is the subject of Tubercle the milk may contain them in greater or lesser numbers. They are not always, indeed but rarely, found in milk of animals whose udders are not tuberculous. Experiment appears to prove that Tuberculosis may result from inhalation, ingestion, and submucous and subcutaneous inoculation, also by injection into the serous cavities.

The power retained by the bacillus after remaining on walls, etc., and communication by inhalation, suggest isolation and thorough disinfection.

The existence of bacilli in milk, and the ease of destroying them by heat, tell us that boiling milk for a short time and the thorough cooking of meat are likely to obviate the production by these media.

To legislative and preventive measures there seem to be almost insuperable barriers, owing to its general distribution, insidious attack, and consequent difficulty of detection in early stages, while the fact of high-priced animals being so generally affected is of great importance in obtaining ways and means. I fear no practical measure can be thorough.

Variola, Vaccinia, Cow-pox.—Though Cow-pox in no form may be deemed a fatal disease, it is the source of considerable annoyance and loss. Its chief interest, however, accrues to the part it has played in the measures adopted to prevent Small-pox in this country.

Probably the majority of thinkers hold to the view that cow-pox is identical with small-pox, simply modified by passage through the cow. Jenner, Ceely, and Simmond's works on this subject are historical. Ceely states that by inoculation with Small-pox matter he produced lesions in the cow identical with those of Cow-pox. When lymph from these was transferred to the human subject Vaccinia resulted.

Counter experiments of Chauveau failed to produce Vaccinia with human Small-pox lymph; and though other pathologists, notably Dr. Voigt, have

given reports of experiments which *prima facie* support Ceely's, we cannot say that we are yet in a position of certainty.

It does, however, from experiments and ordinary observation, appear beyond doubt that Cow-pox is communicable to the human subject, inducing Vaccinia in him, and also protecting him to a smaller or greater degree from severe attacks of Small-pox.

It has been regarded of common occurrence and well known to the profession; certainly by that name we have always recognised a disease which modern *pathologists* have flavoured and dished up as though it were some rare or unknown luxury. It would appear to have an abiding influence in certain parts of England, notably Wiltshire, Gloucestershire, Somerset, etc., where Jenner first studied the diseases, and certain most interesting, and so far instructive, investigations have been lately carried out by Professor Crookshank, of King's College. As I was privileged to see some of the cases and result of inoculation, and as it is possible that some of us may not have met with it, I may be allowed to give a brief description of the condition.

Jenner says that an attack of Cow-pox does not give immunity from Cow-pox, but Crookshank says it does for a time at least. The exact nature of the virus has not been determined, and though both by Jenner and Ceely it has been vaguely associated with Grease in horses, I find no substantial evidence to support this view.

Amongst cattle this naturally contracted disease is almost exclusively confined to milch cows, though, as we all know, it is readily produced artificially in calves.

Unless we carefully watch an outbreak we shall not have an opportunity of observing the early stages; it is usual that our attention is drawn to the crusts.

The first symptom is often slight pain on being milked, then a feeling as of hard patches about the teat—papulation. In the course of three or four days these become vesicles, varying in size and shape from that of a pin's head to that of a shilling. The vesicle assumes a peculiar umbilicated form, most of them having a *marked* central depression and indurated edges. In further three or four days they are mature, and usually surrounded by a distinct and almost characteristic areola. This stage at different periods (sometimes determined by the amount of interference with the teats in milking) runs into that of the crust, which is dark brown or even black, occasionally very large by confluence of lesions. Where rough usage in milking has obtained we may find considerable ulcers. Throughout this stage the teat is usually red and swollen. It spreads through a dairy with a regularity that suggests the transference of the contagion by the hand of the milker. The latter phases of the lesion might cause it to be confounded with ordinary chapped teats, but its course will be sufficient to differentiate.

Jenner indicates a white-pock, blister-pock, or white vesicle, transferable to man by contact, as liable to be mistaken. Ceely and Herny insist on this being merely a slight effusion and raising the epidermis, without central depression or cellular infiltration, of a transient nature, and not giving rise to systemic disturbance.

This disease is usually communicated to the milkers, in whom, after a period of about three days, we have evidence of Vaccinia, which runs through a course similar to the lesion of protective vaccination.

Though not commonly, men having previously suffered from Small-pox or Vaccinia may contract the disease. One attack secures immunity only for indefinite periods; we should expect this from the frequent taking of the second vaccination in man.

Scarlatina.—Diseases of the cows' teats have recently acquired a specia,

interest, as they have been, by the medical officers of the Local Government Board and Dr. Klein, most intimately associated with the production of scarlatina. That milk is probably a most favourable medium for the development of low organisms, as bacteria, or mechanical means for the *dissemination* of the virus of disease, cannot be questioned; but notwithstanding all that has been said, I do not think we are yet in a position to say that a certain disease of cows' teats associated with a scaly condition of the skin is identical with human Scarlatina. The discussion of this matter must be so fresh in your memory that I need scarcely dwell on it. Dr. Klein describes the condition—ulceration, covered with scabs in the teats and udder; ulceration, scab, scurfiness, and loss of hair in patches in different parts of the skin.

The animals were thin, and showed slight cough, but no rise of temperature. Dr. Klein isolated a round bacterium, a streptococcus, which inoculated into calves produced sometimes cutaneous visceral disease which very much resembled that of the Hendon cows.

This description, published in June, 1887, is not very conclusive, and up to this date little has been reported which substantiates the position taken by Dr. Klein. Notwithstanding, it will be clear to us that it should have our consideration when dealing with disease of cows' teats.

Antinomycosis.—Probably no condition has received more elucidation from recent research than that now known to depend on the ray-fungus actinomyces. From the earliest records of veterinary medicine, certain diseased states have been recognised and variously named which we now include under the term Actinomycosis. They usually occur as indurations, enlargements, or ulcerations in some parts of the body, and are produced by the irritation of the actinomyces. This is a fungus which seems to be made up centrally of dense tissue, sometimes composed of threads, from which radiate very closely packed filaments of a club shape, having their broadest extremities pointing to the periphery, where they may be branched or not. It thus gives a star-like or radiating appearance to the fungus, which is named accordingly. This fungus gaining the tissues, probably most frequently through an abrasion, sets up irritation, and we have around it a zone of inflammatory product which shows some tendency to vibrate. Microscopically, the lesion is not very unlike that of a tubercle, but its nature is settled by the presence of the fungus. The core may calcify, or break down and suppurate. The actinomyces may be extracted from the lesion, cultivated, and inoculated into healthy animals produces the disease. Though it has been met with in the sheep, goat, and horse, the ox appears to be the most commonly affected amongst our patients. The reason for this is not yet clearly explained. The disease is most frequently recognised in the tongue of the ox under various appellations, as scirrhous tongue, wooden tongue, etc., and is quite familiar to all of us; in growths about the face known as Osteo-sarcoma of the jaw, pharyngeal tumours, Spina Ventosa, Bone Canker, Bone Tubercle, etc.; and under the skin as wens, clyers, etc.; and in some instances have been found the fungus in question apparently standing in relation to the growths as cause to effect. Inferences from these observations have, I am inclined to think, been too inclusive. It seems hardly fair to presume that because in a few instances the actinomyces have been found in these enlargements, every condition which has been described under the terms in veterinary literature is due to the actinomyces. Undoubtedly the disease is more common than it was generally supposed.

Actinomycosis has been found affecting mucous membranes of mouth and alimentary tract, which was considerably ulcerated. The condition known as Tubercular Stomatitis is probably associated with it. Another very important location is the lungs; here the fungus produces a lesion which is quite likely to convey to the casual observer the idea of Tuberculosis. The lesion is

about the same size and in the same situation. It is, however, more often purulent, and if the pus be squeezed out, small, firm, grease-like matter may be distinguished in it, and if these be examined microscopically the fungus may be found. Actinomycosis has also been recognised as a disease of the human subject. It is in him more often associated with extensive suppuration. The fungus has been found in abscesses in the pharynx, peritonæum, stomach, intestines, liver, pleura, lungs, jaw, etc. The inference is that it may gain entrance by inoculation, ingestion, and inhalation.

Between the fungus found in the human and bovine lesion there has been supposed to exist some structural difference, but the disparity seems to decrease as our means of research develop, until now I think I may say that any divergence may be accounted for by variety of soil.

Quite recently Professor Crookshank, who has done admirable work in this direction, has with the actinomyces from a human patient infected a calf, and demonstrated in the calf actinomyces almost indistinguishable from that of which it is the host by natural selection. I am indebted to him for two slides now before you. These are the most reasonable grounds for the belief in the communicability of Actinomycosis of cattle, a disease whose importance from an economic point of view is considerable to man, in whom the disease is most serious.

The fungus does not appear capable of resisting the action of powerful disinfectants, and when near the surface of organs these agents are often effectual in destroying it and arresting the disease. When practical, of course excision should be resorted to.

Foot-and-mouth Disease.—Many observers regard this as communicable to man. Klein says it is due to a streptococcus which he has isolated.

Evidence of transmission to man is of a general rather than of a special character. It is said to induce in him by direct contact a mild eruptive disease of a vesicular character, affecting lips, and tongue, and fingers. In a somewhat extensive experience, I have not been able to witness a case. The situation of course invites us to be on the watch, and hope we may have the result of your experience in the matter.

Diphtheria.—Many attempts have been made to connect Diphtheria with diseases of the lower animals, one recent writer fitting Strangles with its production. I do not think that we are yet warranted in accepting any evidence as conclusive, but some general statements and more careful observation suggest a connection with our special patients. The recent announcement of the discovery of the organism giving rise to Diphtheria may, I hope, be correct, and if so our chances of discovering any connection which may exist between it and conditions of the lower animals will be much enhanced.

There are several parasitic diseases of the lower animals communicable to man, but time forbids even mention of them.

The reader drew attention to the necessity for the scientific inspection and control of abattoirs, mixed sanitary boards, and the study and discussion of matters pertaining to the communicability by both branches of the medical practitioners.

The address was attentively followed, and was applauded at its close.

The PRESIDENT complimented Professor Penberthy on the marvellous way in which he had condensed the subject. He had said enough to show that, time permitting, a day would not be enough in which to discuss the gigantic topic he had brought before the Association. He was bound to say, however, that he had been staggered by the Professor's remarks as to the burial and exhumation of animals suffering from Anthrax. He had understood that outbreaks were sometimes traced to the fact of animals having grazed over ground in which the carcases of animals dead of Anthrax had been buried. He remembered seeing the accounts of such a case in Leicestershire. It was

worthy of remark that under the Contagious Diseases Acts animals might often have been destroyed for Splenic Apoplexy when they were only suffering from Black-quarter. As to Anthrax in pigs, he had last summer been called to some pigs which seemed to be suffering from malignant sore throats, which he took to be anthracoid. He asked, "What have you had dead in the place?" and was told that a calf had been "struck." Pigs, and dogs also, would eat "struck" calves with impunity, yet in this case there was a distinct outbreak of the disease, emphasised by the fact that pigs which had had no access to the food were free from Anthrax. Professor Penberthy had thrown a great deal of light on Glanders. If he found a cat suffering from Glanders he would not give it an opportunity of recovering. Apparent cases of recovery in horses had often been seen to be no recoveries at all. As to Rabies, he had harped on that subject in season and out of season. Nothing could be more simple than to stamp it out. It was absurd to talk of the "cruelty" of the process. A town councillor in the Midlands was reported to have said that the way to drive a dog mad was to muzzle him. If such gentlemen could produce the virus by putting on a muzzle they had something new to learn. A dog might be taught to wear a muzzle as a young horse wore a halter, and if the life of a single human being could be saved the little inconvenience suffered by dogs would be more than justified. What had been said as to Tuberculosis showed the vital importance of never breeding from a family in which there was the slightest trace of the disease. He had never seen a case of Foot-and-mouth Disease in a human being, and he had even drunk with impunity the milk of an animal affected with it.

Mr. LODGE (Dewsbury) said that, on the contrary, he had seen such cases developed in farm servants. Would the Professor say what form Glanders took in the dog, and how the boy who had been affected with Cowpox caught the disease.

Professor PENBERTHY: He was inoculated.

Mr. LODGE: I was rather inclined to think that the pictures looked like Scrofula more than anything else.

Professor PENBERTHY: Oh, no. The boy was quite happy five weeks afterwards.

Dr. BARLING said that he thought some of the most interesting work in existence was done in connection with diseases capable of transmission from animals to man, and *vice versa*. The advantage of hearing papers like that to which they had listened was that one became familiar with the life-history of the virus—a most essential thing. There were two difficulties they had to contend with: that of people who accepted micro-organisms as the causes of disease, and having open minds, talked very loosely about things which deserved precision; and that of those others who would believe nothing, and would not take the trouble to investigate. As to Rabies, he would have had no difficulty in saying, had Professor Penberthy refrained from doing so, that they might accept the Pasteurian method as an almost absolute protection. His authority was Mr. Victor Horsley, who, in a paper read lately before the Epidemiological Society, gave statistics, compiled by himself, to show that of people who were bitten by dogs which had died of Rabies 15 per cent. succumbed if left to the ordinary treatment; while if they were treated by the Pasteurian method only 1·3 per cent. died. He would be glad to hear whether the Professor accepted those statistics. With regard to the extermination, he had the fullest confidence in the efficacy of the preventive measures which had been recommended. As to other diseases which had been treated of, it seemed to him that what was wanted at present was an agitation for greater powers to deal with affected animals, and more especially with tubercular animals. He did not suppose for a moment that they would stamp out Tuberculosis, but they might diminish the amount of it,

and render safer the consumption of food and milk. In a town like Birmingham there were probably thousands of children brought up on uncooked milk, and one tubercular cow was capable of affecting hundreds of children. Of course, if the udder was not affected his own impression was that the milk was free from the disease. Doctors relied, too, upon raw meat juice as very efficacious in illness, but if it was taken from tubercular animals it would be a very ready source of danger. He would like to be informed whether when an animal was affected in the mesentery the blood and tissues generally were also affected.

Mr. OLVER thought that it was well worth while to assign another meeting for the discussion. He was particularly grateful for Professor Penberthy's suggestion of a possible Anthrax of the bowels. He had seen some marked cases of the transmission of Foot-and-mouth Disease to the human subject; at least he so diagnosed them, and the medical men of the neighbourhood agreed with him. As to Tuberculosis, and the condition of the udder, who was to decide when the inceptive stage began? It was much to be regretted that dairies were not subject to inspection by experts, but only by policemen. What had been said on the subject of Rabies reminded him that he had heard of cases treated on the Pasteur system, in which the dogs recovered and the persons so treated died.

Mr. WOLSTENHOLME (Manchester) felt it his duty to accentuate the feeling of veterinary surgeons, that they ought to be the recognised authorities in matters of inspection. There was a disease which had been omitted from Professor Penberthy's list, and which was almost claimed to be communicable. He referred to the analogy between so-called Parturient Apoplexy in cows and Parturient Fever in human beings. In Manchester, they would be interested to learn, a discussion had been arranged for between veterinary surgeons and general surgeons on that subject; and he wished to invite all gentlemen who were present, and who had any special knowledge of Parturient Apoplexy in the cow, to be present. He was told that in the breed of Herefords it was almost unknown. As a Manchester man, concerned for the high death-rate in that city, he was much impressed with the importance of checking the food supply properly. The French Government had an excellent law as to tubercular animals.

Mr. WARTNABY testified as to the contagious character of *Eczema Epizoötica*. A farm labourer once showed him an affection of the finger-nails which appeared to be Eczema, and which he said he had caught from milking cows when they were suffering from that contagious disease.

Professor PENBERTHY, in replying, said that there was a good deal of difference between a bacillus and a spore. The bacillus, a long rod, was got rid of easily. The spore was not got rid of in ten or twelve years. But spores did not exist in the blood, and only formed afterwards, when there was free access of oxygen; so that if animals could be buried at once, before putrefaction set in, they were inert for mischief. He did not want them to take his advice about distributing the carcases after exhumation, but if the whole process could be carried out perfectly there would be no danger in it. He could endorse what had been said about Anthrax and Black-quarter. In every case in which he had been called in as a consulting surgeon the latter had been mistaken for the former. But extreme care, without a microscopical examination, would, in the majority of cases, enable an expert to distinguish between the two. The Anthrax bacillus was not gasogenus; the other was a regular gas-producing agent. In Anthrax there was rarely any extensive local lesion, but in cutting down through a muscle of Black-quarter the condition one found needed no describing. The case of pigs affected with "anthracoid sore throat" was rather interesting, but he must be permitted to say that the term "anthracoid" was the most confusing word ever devised. Either there

was Anthrax or there was not. The case was interesting because Anthrax, so far as he knew, could not be produced in the pig experimentally and at will. Four years ago Pasteur gave him some of his strongest Anthrax material, and he began injecting into a pig enough to kill half a dozen oxen, but it had no effect beyond that of raising the temperature to 105 or 106°. But feeding with an abraded mouth produced the so-called anthracoid sore throat, which was really malignant Œdema in conjunction with Anthrax. Two or three years ago there was a fuss made about pigs in Cheshire. It was absolutely denied that pigs could have Anthrax, but Toussaint's discoveries in France overset that opinion. As to Rabies, as far as the experimental conditions went, he absolutely agreed with Pasteur. He was the only Britisher who had ever worked in Pasteur's laboratory, and he knew that everything Pasteur put in print was written without bias. The people who wrote about him in the *Morning Post* and the *Standard* had no right to speak of him. He was in an atmosphere which they could not breathe. They should be simply obliged for the good he had done to humanity in a variety of ways. There was not the slightest doubt that the twenty-three dogs which were inoculated protectively did not take Rabies, while the twenty-three unprotected ones put beside them did; or that Horsley's experiments, and the experiments of the Commission formed of Horsley, Sanderson, Sir Henry Roscoe, Sir James Paget, and Dr. Fleming, were trustworthy, and did achieve results which in substance agreed with the other results. Two members of the Commission fought it out tooth and nail until they were compelled to sign the report. Experience told us, however, that the matter was still *sub judice*. That people had been killed by Pasteur's inoculation there was very little doubt, and that other people had died who should not have done was very likely. The agitation in favour of legislation as to Tuberculosis was in good hands. Diplomacy and politics, not the necessity of preventing disease, would, however, determine the question of time. If the prevention of Tuberculosis would enable either party to hold office a little longer, Tuberculosis would be prevented; if not, Tuberculosis wouldn't. (Laughter and Hear, hear.) Moreover, the profession was rapidly gaining influence with the higher grades of the public, and so he bade them be of hope. In reply to one gentleman, he had to say that, so far as he knew, Tuberculosis was not found in the muscles, but in the lesion. He had never found the tubercle bacillus in the milk of even markedly tuberculous animals, except when the mammary gland was affected. As to the need for qualified inspectors for abattoirs, dairies, shippons, etc., in connection with medical and sanitary boards, it came home to them that they must make themselves fit to hold the position of such inspectors. The demand for them would be heard soon enough. They were appreciated fairly at their own value.

Mr. PARKER moved a vote of thanks to Professor Penberthy for his admirable lecture, and the motion was seconded and cordially agreed to.

Mr. BEDDARD proposed that the next meeting of the Association be held at Wolverhampton, where he assured the members of a hearty welcome.

Mr. MERRICK seconded the motion, and it was carried.

The officers returned thanks for their election, and the meeting then terminated.

Army Veterinary Department.

Gazette, March 15th.

Veterinary Surgeon J. T. Dibben to be Veterinary Surgeon, First Class, ranking with Captain.

There has been a severe outbreak of Surra among the horses, mules, and ponies in the Mecktila district, Upper Burma. The 1st Madras Lancers was

very severely attacked, and of 87 horses affected 76 died. Altogether 162 animals suffered, of which 130 succumbed and 32 recovered. Veterinary Surgeon Fowler was in professional charge of the camp, and his successful efforts in suppressing the disease have received high commendation.

Veterinary Surgeon C. E. Bennett delivered a very interesting lecture at the United Service Institute, on March 15th, General Erskine in the chair, on "The Employment of Dogs in War."

Obituary.

The death of the following members has been notified:—

Bond, W. H., Buckingham	graduated	1872
Aitken, D., Loughborough	"	1879
Bryce, J. H., Stirling	"	1875
Callender, J., Falkirk	"	1880

Notes and News.

THE RABBIT-PEST IN AUSTRALIA.—It would seem probable that the immediate decision which M. Pasteur is reported to have demanded by telegraph from the Intercolonial Rabbit Commission will not be favourable to his claims. Professor Allen, the President of the Commission, drafted a report last December, which deals with the result of the experiments made at Rodd Island with the virus of chicken cholera sent out by M. Pasteur, as well as with the other experiments made under the supervision of the Commission. The *Australian Medical Gazette* states that this report expresses the opinion that the tendency of the experiments made with the virus of chicken cholera is to prove that it is totally inefficacious for the extermination of rabbits under the conditions which prevail in the interior of the continent. The microbes, it is asserted, will lose their virulence after a few hours' exposure on a moderately warm day, or when subjected to the drying effects of wind. The Tintinallogy disease is also dealt with at length, the conclusion being that the operations conducted with that outbreak have no scientific value whatever. The disease discovered by Professor Watson, of Adelaide—the *sarcoptes cuniculi*—is also dealt with, and further investigation is recommended with the bladder-worm, which is said to have cleansed the Wairarapa district in New Zealand.

THE SALE OF HORSEFLESH.—In a bill introduced by Mr. Knowles, M.P. for West Salford, it is proposed to establish regulations concerning the sale of horseflesh for human food. The first provision is that every horseflesh shop is to be registered at the office of the local authority, and there is to be posted over the shop, in a conspicuous position, an indication in large letters that horseflesh is sold there. If a person has not asked to be supplied with horseflesh, it is not to be sold to him unless with a label containing the word "horseflesh." If, however, he has asked to be supplied with it, it would appear that no label is required. Medical officers of health are empowered by the Bill to inspect any meat they believe to be horseflesh, and to carry it off in order to have it dealt with by a magistrate, and search warrants may be granted by a magistrate where it is believed that horseflesh intended for sale is concealed. For an offence against the measure the penalty may be a fine of £20, and the onus of proving that any horseflesh is not intended for human food is to rest with the accused. For the purposes of the Bill "horseflesh" extends to the flesh of asses and mules.

THE MAYOR OF TAMWORTH.—The foundation-stone of the new assembly-rooms at Tamworth, to be erected this year in commemoration of the Queen's Jubilee, was laid recently by the Mayor, Mr. Harry Olver, F.R.C.V.S. The building and site will cost nearly £5,000.

A LADY HORSE-DOCTOR.—A clever and learned *Parisienne*—who had duly taken out her diploma as a "Doctoress in Medicine"—lately furnished a fine *appartement*, put a brass plate on her door, and waited, like Bob Sawyer, for patients who never came. The lady, therefore, went through a course of veterinary surgery and medicine, and is now prosperously practising as a "horse-doctoress." This is evidently a new profession for young damsels, and the Paris "lady vet." is (the *Daily Telegraph's* correspondent says) undoubtedly the first of her sex in this country who has ever qualified herself by a course of hippo-pathology for the useful task of prescribing remedies for the cure of the diseases of animals. It is to be presumed, however, that the lady will not continue to compete with the male vets. in treating horses, but that she will confine herself to the lighter labour of alleviating the sufferings of sick lap-dogs.

Correspondence.

THE NATIONAL VETERINARY ASSOCIATION.

DEAR SIR,—As the letters which appeared in the March number of the VETERINARY JOURNAL are again full of what Mr. Hurndall calls "flagrant misrepresentations," I must once more ask you to kindly publish my final answers to them. Mr. Hurndall accuses me of "intruding myself upon this correspondence," but surely the Secretary of an Association is the proper person to answer questions relating to it, especially when his actions are brought into question. Mr. Hurndall must not consider he has the exclusive right to question other people, without being questioned himself in return; and I am pleased to find that his mind has been thoroughly disabused on this point. Mr. Hurndall must have very peculiar ideas of "worshipping," if he considers any of my communications solicit or implore him to do anything of the kind. I believe they were straight to the point, and evidently Mr. Hurndall thinks so, if he actually considers they require him to "bow down and worship." What I did hope for, however, and what we have never been able to obtain, were the simple, honest "facts" connected with the argument, and he politely tells us he is "not going to satisfy Mr. Banham's curiosity."

Mr. Hurndall says my letter in the February number of the VETERINARY JOURNAL is "over-full of flagrant misrepresentations," and goes on to say that he had "no communication of any sort or description, either verbally or written," with Mr. J. Simpson, before November. All I can say is, that all the other members of our committee (except Mr. Simpson) kindly informed me that they had not divulged the business of the meeting to Mr. Hurndall. Therefore, my assumption that he obtained his information from Mr. S. is substantially correct. Mr. Hurndall, again, asks me to "retract the charge of untruthfulness;" he surely forgets that he gave me *cause* to make the charge, and hence he is the offender, and as soon as he apologises, I shall be pleased to "retract."

Mr. Hurndall then endeavours to show your readers "how regardless of exactitude Mr. Banham is," and defies me to find any such question in his letter to the *Record* of October 27th, as "How it happened that he was not elected on the Provisional Committee?" Here are Mr. Hurndall's own words, *verbatim et literatim*, from the *Record*: "I am indebted for the *first intimation* of the meeting of the National Veterinary Association [it was a meeting of the *Provisional Committee*.—G.A.B.], held at Red Lion Square, on the 15th instant, but as a member of that Association, who is not behind in the payment of his subscription, and who practises sufficiently near to the metropolitan area to be included therein, I should like to ask how this happens?"

Now your readers can judge for themselves whether this is not asking why he was not included—or in other words, elected—on the Provisional Committee.

Mr. Simpson's answer is thoroughly characteristic; he assumes the air of a courteous, well-meaning, triumphant man; but in the next sentence he spoils it; because he coolly accuses me of "making statements in which there is absolutely *no* truth." So far as I am concerned, his mild, bland manner of telling me that I am making a false statement rings none the less harshly. If Mr. Simpson would only make full quotations, your readers would not be liable to be misled; but he is careful not to do so, for he quotes me as saying "no rule has been infringed;" which, taken by itself, is tantamount to inferring that *none* of the rules have been infringed at any time; but if you will turn to the whole paragraph from which the quotation is taken (VETERINARY JOURNAL, vol. xxviii., page 148, lines 24 to 28), you will find that it meant that no rule had been infringed with reference to the election of this year's Provisional Committee. I should very much question whether even Mr. Simpson, with all his business tact, can point out any code of rules for an association of any kind that have not been occasionally infringed. I do not deny, nor have I ever said, to my knowledge, that our rules have not been slightly departed from at times; but what I do say and maintain is, that the Association has never suffered therefrom, neither have these deviations been made without the consent of the Council or a committee.

Now we come to the "abuses of privileges" he complains of. I should like to know what harm was done to the Association, or what rules were violated by any of the petty complaints he endeavours to bring against me: 1st, Much to his annoyance, it appears, I asked our members to exchange photographs with me; and I repeat I shall still be very pleased to do so at any time, even if such practice is tantalising to Mr. Simpson. Mr. Simpson makes special complaint of my appealing to the members of the N.V.A. for their vote at last election of Council, on an official circular. The latter was an oversight on my part, but I should have thought even the most malicious person might have let that little fault remain unnoticed until a second attempt at such an awful abuse of privilege had been committed. I know this offended some *few* members of the N.V.A. at the time, although I have never yet had any *official* fault found with me, neither have they told me to stop the practice—not that I intend giving them cause to do so, for I am thoroughly at one with those who think the N.V.A. should have nothing whatever to do with veterinary politics. Moreover, I thought from the way the subject was received by the members present at Newcastle last year, that none of them considered the subject worthy of comment, except the expounder of the complaint—and even he ought to have been satisfied with the result; but I am sorry it still grieves Mr. Simpson. I wonder whether the late President of the R.C.V.S.'s action of altering the order of the names on last year's voting papers *without the sanction of the Council* (which brought Mr. J. Simpson's name from seventh to the top of the list), ever grieved that gentleman, or whether Mr. Simpson considered that a "breach of privilege" to the Royal College of Veterinary Surgeons. I believe he is a very generous man; so, if he chooses, he can this year return good for evil by exerting his energies to secure me a seat on our Council, and I shall be pleased if all your readers will assist him.

As to the last abuse he mentions, viz., that of asking my fellow-members of the N.V.A. to recommend me a good shoeing-smith, I have yet to learn where the abuse comes in, as I did not use the *official circular*, neither did the Association suffer thereby. If Mr. J. Simpson was not pleased with this method of procedure, I can assure him that I was; for, through the kindness of a mutual friend and member of the Association, I was fortunate enough to

secure the services of a thoroughly good man—a *rara avis*. I hope, when Mr. Simpson next writes about the Secretary of the N.V.A., he will have something more substantial to say in his favour than he has said in his disfavour.

My "trump card," as Mr. Simpson calls it, has been dealt with above, but I may say the following is "a fact," of which I have "documentary evidence." The six Vice-Presidents and myself met to elect the Provisional Committee, and all of them (except Mr. Simpson) informed me that they did *not* divulge the business of our Committee to Mr. Hurndall. Therefore your readers may guess—as I have had to do—the source whence that gentleman did receive his information.

The most ungenerous part of Mr. Simpson's last reply to this much too protracted discussion is his allusion to the "very wholesome correction" *he* evidently considers I received at the Eastern Counties Association, which, by-the-by, is quite outside this discussion. He, however, did not tell you that the Eastern Counties Association decided not to make that subject public in any way, and in the face of this he alludes to it. Moreover, he did not tell you that I promised our genial, kind-hearted, and peace-making President that I would say nothing further about it, but leave the matter for the Association to deal with as they thought fit; and if this was to Mr. Simpson's entire satisfaction, he ought to be delighted, and not spoil it by breaking faith with the Association by triumphing in the public press; and, therefore, I consider it a most contemptuous allusion—*Valeat quantum valere potest.*

I am sorry to find the report I received of Mr. Simpson's litigiousness is corroborated by himself, and I hope I have said nothing that can in any possible way be termed libellous; for I can assure him that I have no time nor money to spend in defending any such actions on my own account, whatever I might do for others.

I again thank you, Mr. Editor, for your courtesy in permitting me to place my case before the profession, and trust I shall not be called upon again to trespass upon your generosity in defending such trivial charges as have been brought against the N.V.A. and

GEORGE A. BANHAM,
Downing Street, Cambridge. *Hon. Gen. Sec., N.V.A.*

DO BOVINES PERSPIRE?

SIR,—In reply to Mr. Gray, I do not pretend to be an authority on the histology of the skin, and must fall back on the researches and teaching of Dr. Burdon Sanderson, and until some one equally able proves conclusively to the contrary, I must still hold those views.

Has Mr. Gray mistaken the effects of "cutaneous respiration" for "perspiration"? The former goes on at all times, and is accelerated in certain stages of disease; the watery vapour given off during that process coming in contact with a colder medium, condenses and hangs on the skin and hair in bead-like particles. Hence the condition miscalled "sweating," met with in Parturient Apoplexy and other bovine ailments.

The "favourable sign" met with in "healthy cattle packed together in close-covered yards" is partly due to the same cause, but principally to the increased action of the sebacous glands, and called by farmers "sweating." Any one who will take the trouble to handle a number of feeding cattle will be soon convinced on this point.

In dealing with owners of animals it is often necessary to make use of "familiar expressions," but in writing fo· medical journals this should be avoided if the terms used are scientifically incorrect.

Mansfield Woodhouse, Notts. JOHN BRETT.

ARE CORNS IN HORSES' FEET HEREDITARY?

SIR,—Some time ago I attended a cart mare belonging to a small farmer in this district. She had what I might safely term "bad corns" in both fore feet. This mare's first foal was bought by a neighbouring farmer, and strange to say, when shod for the first time, at two and a half years old, it had well-developed corns in both feet. P. BEATTIE.

Boyfern Fishrie, Turriff.

A CORRECTION.

DEAR SIR,—In the report of the proceedings of the Yorkshire Veterinary Medical Society in this month's Journal I am made to have said that the insertion of the ordinary *tampon-cannula tube* was superior to the operation of laryngo-tracheotomy, for certain reasons mentioned by me at the time. What I wish to draw your attention to, and wish you to mention in your next issue, is the fact that I said "the ordinary tracheotomy tube," not, as reported, "the tampon-cannula tube." GEO. W. CARTER.

Keighley, March 16th.

"HIPPACEA."

DEAR SIR,—I would not trouble you again, but Mr. Nettelton's attempt to emphasise his previous mis-statement, that we sent "Hippacea" on sale or return to Northallerton, necessitates my doing so.

We have never sent "Hippacea" to any one in Northallerton on sale or return, but we did execute a *bona-fide* order for "Hippacea" from the chemist Mr. Nettelton names, Mr. Warrior, who paid for same in the ordinary course.

If Mr. Nettelton seeks further proof that he is in the wrong, we shall be pleased to furnish it, if he will give us the pleasure of a call at any time during business hours that may be most convenient to himself.

F. H. BOWDEN, Managing Director.

OPERATION FOR THOROUGHPIN.

SIR,—Having been asked by one of my professional brethren for some further information concerning my article in the VETERINARY JOURNAL for February, on the "Operation for Thoroughpin," I thought I could not do better than send you a copy of the questions and answers for publication.

1. How long does it take to effect a perfect cure? About eight or nine weeks. If the horse has a Thoroughpin on both hocks only one leg can be operated on at a time.

2. Is it necessary to apply a high-heeled shoe? I prefer using a high-heeled shoe.

3. Does the operating iron require more than once heating for each sac punctured? Once heating of iron suffices for each sac.

4. Would you mind giving a drawing of your iron? Drawing herewith supplied.

5. Does the iron give the operator any idea as to when you have reached the wall of the sac? The movement of the iron can be easily seen under the skin from without, and the operator must be guided by his own judgment as to when he has reached the opposite wall of the sac.

6. How much oil of turpentine do you inject? As much as fills the sac.

T. FLINTOFF, A.V.D.

SIR,—Referring to the "Remarks on Firing" made by Mr. Flintoff, V.S., in last month's Journal, allow me to say that, in the first place, the method he suggests, although it appears to be so far satisfactory in the hands of Mr. Flintoff, can have little or no advantage over the old methods of transverse and feather firing, either in its severity or in setting up the reparative inflammation, seeing that the surface with which the instrument recommended comes in actual contact is less, and that the instrument must not be allowed to penetrate deeper than the skin, the latter being the case in the ordinary method.

Secondly, he states, "Many readers will doubtless argue that to fire a structure like the perforans tendon in this way will have the effect of destroying the elasticity of the tendon." Now, I think all will agree that to fire that tendon would be a very difficult matter, as the perforatus forms a sheath for, and is posterior to, the perforans; nevertheless, as we all well know, a great and permanent benefit is often obtained by firing in cases of sprain of the perforans tendon, which benefit is, in my opinion, effected by its being involved in the surrounding reparative inflammation, which commences primarily in the cutaneous and subcutaneous tissue. As to the operation destroying its elasticity, I can hardly see how it is possible for it to do that, since tendons composed of white fibrous tissue are entirely inelastic, as distinctly stated by Principal Williams in his work on Surgery.

With regard to the after treatment advocated I have little to say.

I quite agree with Mr. Flintoff in the application of a blister of full strength to the newly fired parts, but I can scarcely see the necessity of applying, as he recommends in the second and third blistering, the blister twice the ordinary strength, and for at least three-quarters of an hour each time.

For my own part, I maintain that in almost any case in which blistering is required, if it is well applied for the space of about fifteen minutes it will have punctured as deeply as if it had been applied for three-quarters of an hour, so that it is a loss both of time and labour to continue the application for the length of time suggested by Mr. Flintoff.

Wolverhampton. G. M. YARDLEY, M.R.C.V.S.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from R. Roberts, Wrexham; H. Kidd, Hungerford; G. A. Banham, Cambridge; R. Sturge, Ontario, Canada; W. T. Adams, A.V.D., Oossoor, Madras; Messrs. Arnold and Sons, London; E. E. Bennett, A.V.D., Woolwich; G. T. Pickering, York; P. Beattie, Turriff; J. Brett, Mansfield Woodhouse; R. S. Barcham, North Walsham; J. Cammack, Kimberley, S. Africa; G. W. Carter, Keighley; J. Malcolm, Birmingham; T. Flintoff, A.V.D., Dublin; R. Rutherford, Edinburgh; G. M. Yardley, Wolverhampton; F. H. Bowden, London; T. B. Goodall, Christchurch; A. W. Hill, London.

BOOKS AND PAMPHLETS: *Dr. Boschetti*, L'Anatomia dell'Homo; *Stebler, Schröter, and A. N. McAlpine*, The Best Forage Plants; Bibliographer; *Dr. F. Lupinacci*, La Mascalcia Militare; Report of the Minister of Agriculture for the Dominion of Canada; Memorandum on an Outbreak of Surra at the Stables of the Bombay Tramway Company.

JOURNALS, ETC.: *Quarterly Journal of Veterinary Science in India; Russian Veterinary Journal; Journal of Medicine and Dosimetric Therapeutics; Clinica Veterinaria; Journal of the National Agricultural Society of Victoria; Wochenschrift für Thierheilkunde und Viehzucht; Recueil de Méd. Vétérinaire; Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie; Annales de Méd. Vétérinaire; Der Thierarzt; American Live Stock Journal; British Medical Journal; Echo Vétérinaire; Revue Vétérinaire; American Veterinary Review; Lancet; Live Stock Journal.*

NEWSPAPERS: *Singapore Free Press; Bournemouth Visitors' Directory; East Cumberland News; Westmoreland Gazette; Daily Chronicle.*